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R. Butler

# CHAMBERS'S
# ENCYCLOPÆDIA

# CHAMBERS'S

# ENCYCLOPÆDIA

A DICTIONARY

OF UNIVERSAL KNOWLEDGE FOR THE PEOPLE

ILLUSTRATED

WITH MAPS AND NUMEROUS WOOD ENGRAVINGS

VOL. III

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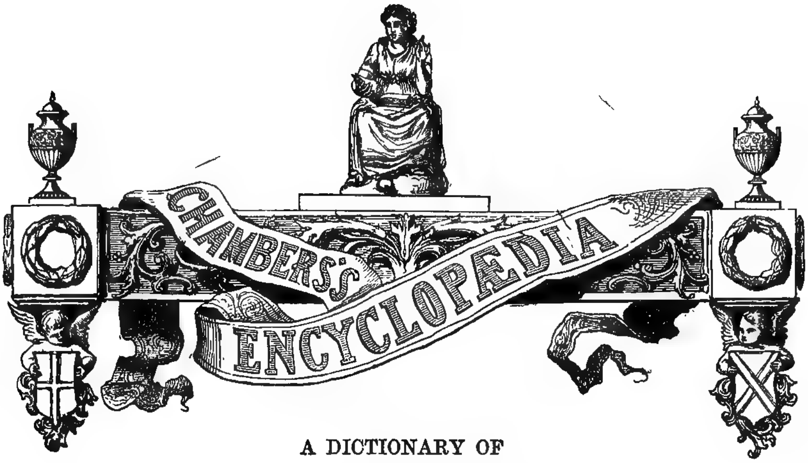
*The Map of Canada properly belongs to Vol. II. of this Encyclopædia, but its appearance, from unavoidable causes, has been delayed till now.*



# A DICTIONARY OF

# UNIVERSAL KNOWLEDGE FOR THE PEOPLE

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## CHIVASSO—CHLAMYPHORUS.

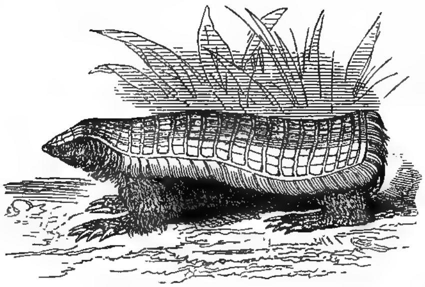
**CHIVA'SSO**, a small city of Piedmont, Northern Italy, situated in a fertile plain on the left bank of the Po, about 15 miles north-east of Turin. It was formerly a place of considerable military importance, but its fortifications were destroyed in 1804 by the French. The lampreys of C. are celebrated throughout Piedmont. It has manufactures of bricks, earthenware, soap, &c., and a trade in the agricultural produce of the district. Pop. about 8000.

**CHIVE**, or **CIVE** (*Allium schœno'prasum*), a plant of the same genus with the leek and onion (see ALLIUM), a perennial, ½—1 foot in height, with very small, flat, clustered bulbs, increasing by its bulbs so as to form a sort of turf. The leaves are tubular, cylindrical-tapering, radical, nearly as long as the almost leafless flowering-stem, which is terminated by a hemispherical, many flowered, not bulbiferous umbel of bluish red, or, more rarely, flesh-coloured flowers. The stamens are included within the perianth. This rather pretty little plant grows wild on the banks of rivers, and in marshy or occasionally flooded places in the middle latitudes of Europe and Asia. It is a rare native of Britain. In some of the mountainous districts of Europe a variety is found, larger and stronger in all its parts, and with flowering-stems more leafy. Chives—the name is generally used in the plural—are commonly cultivated in kitchen-gardens, often as an edging for plots, and are used for flavouring soups and dishes. Their properties are very similar to those of the onion. The part used is the young leaves, which bear repeated cuttings in the season.

**CHIZEROTS AND BURINS** form one of those peculiar races in France that live isolated in the midst of the rest of the population, and are despised and hated by their neighbours. They live in the arrondissement of Bourg-en-Bresse, in the department of Ain; and the communes of Sermoyer, Arbigny, Boz, and Ozan belong to them. According to tradition, they are descended from the Saracens. Although industrious and prosperous, they are held in the utmost contempt and detestation by their peasant neighbours, who are often indolent and destitute. They are looked upon as covetous and malicious, and scarcely would the daughter of a small farmer, or well-to-do day-labourer, become the wife of one of them, so that they mostly marry among themselves. From time immemorial, the C. and B. have been field-labourers, cattle-dealers, butchers, &c. Many of them are very good-looking. The young women are handsome, clear-complexioned, with large black eyes. See Michel, *Histoire des Races Maudites de la France et de l'Espagne* (2 vols. Par. 1847).

**CHLADNI**, ERNST FLORENS FRIEDRICH, founder of the science of acoustics, was born at Wittenberg, November 30, 1756. He studied law in his native place, and also in Leipsic, where, in 1782, he was made Doctor of Laws. C. ultimately abandoned juridical studies altogether, devoted his mind to natural science, and, being acquainted with music, was led to observe that the laws of sound were by no means so well established as those of other branches of physics. He therefore began to apply his knowledge of mathematics and physics to acoustics, and travelled for ten years (after 1802) through Germany, Holland, France, Italy, Russia, and Denmark, giving lectures on the subject, which were very successful. He died in Breslau, April 3, 1827.—C.'s writings include, *Discoveries concerning the Theory of Sound* (1787), *Acoustics* (1802), *New Contributions to Acoustics* (1817), and *Contributions to Practical Acoustics, with Remarks on the making of Instruments* (1822). C. also wrote several essays on meteoric stones.

**CHLAMY'PHORUS** (Gr. chlamys-bearing; *chlamys*, a soldier's cloak), a very remarkable genus of mammalia of the order *Edentata*, ranked by naturalists in the same family with the armadillos, but differing in important respects from them, and from all other known quadrupeds. Only one species is known, *C. truncatus*, five or six inches long, a native of the interior of Chili, living underground like the mole, which it much resembles in its habits, and feeding on the same kind of food. Its fore-feet are adapted for digging, although in a different manner from those of the mole. The skull is destitute of sutures; there are resemblances to the osteology of birds in the ribs and their union to the sternum; the hinder part of the body is altogether unlike that of any other known animal, in its terminating quite abruptly, as if cut off almost where its thickness is greatest, or as if the back were suddenly bent down at right angles, the tail not springing from where the line of the back appears to terminate, but far below. The whole upper and hinder parts of the body are covered with a coat of mail, made up of a series of square plates; the under parts and legs are covered with long silky hair. The tail is very peculiar; it is covered with small scales, is expanded at the tip, and is usually incurved along the belly, but is furnished with such muscles as to suggest the probability of its being employed to throw back the earth in excavations.



Chlamyphorus.

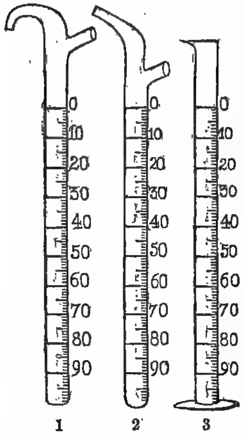
**CHLOPICKI**, Joseph, a Polish general, and Dictator of Poland during the revolution of 1830, was born in Galicia in 1772. He entered the army in 1787, attracted the notice of Kosciusko during the first insurrection of the Poles, and after the storming of Praga, 9th November 1794, when the hopes of the patriots were extinguished for awhile, he passed into the service of the new Cisalpine Republic, and distinguished himself in various battles. In 1806 when Bonaparte called the Poles to arms, C., among others, obeyed, and fought gallantly at Eylau and Friedland. He was subsequently sent by the emperor into Spain, and in 1812 followed him to Russia, taking part in the bloody engagements at Smolensk and Moskwa. After the relics of the invading force had returned, C. left the imperial service, on account of receiving certain slights in the way of his professional advancement. After the taking of Paris by the allies in 1814, he led back to Poland the remains of the Polish troops who had fought under Bonaparte, and was well received by the Emperor Alexander, who made him a general of division. When the second insurrection of the Poles broke out in 1830, C., who foresaw the hopeless nature of the attempt, concealed himself; but the voice of the nation called him forth from his hiding-place, and on the 5th December 1830, he was elected dictator. His moderate views, however, involved him in disputes with the extreme patriotic party, and on the 23d January 1831, he resigned his office; but, to prove his sincerity, he entered the Polish army as a simple soldier, and took part in the murderous battles at Wavre and Grochow. After the suppression of the insurrection, C. went to Cracow, and withdrew altogether from public life. He died at Krzeschowitz, 30th September 1854.

**CHLO'RAL** ($C_4Cl_3HO_2$) is a body formed when anhydrous alcohol is acted upon by dry chlorine gas. It is an oily liquid with a peculiar penetrating odour.

**CHLORANTHA'CEÆ**, a natural order of exogenous plants, closely allied to the peppers; herbaceous and half-shrubby plants, with jointed stems, opposite simple leaves, and minute stipules between them. The flowers are in terminal spikes, and are destitute of calyx and corolla, but have each a small scale or bract. The stamens are lateral; either only one or few, and partly cohering. The ovary is one-celled, immediately crowned with the stigma; the ovule is pendulous; the fruit a drupe or one-seeded berry; the embryo naked, not in a fleshy sac as in the peppers.—The number of known species is small: all of them are tropical, or natives of China and Japan. They are generally aromatic, and some of them, as species of *Chloranthus* in the East Indies, and of *Hedyosmum* in the West Indies and South America, are used as antispasmodics, stimulants, stomachics, and tonics. The roots of *Chloranthus officinalis* and *C. brachystachys* have been ranked among the most efficacious remedies in fevers and other diseases requiring continual and active stimulants, and instances have occurred of great benefit from their employment during the prevalence of epidemics in Java. *C. inconspicuus* is the Chu-Lan of the Chinese; its leaves, spikes of flowers, and berries are used by them for imparting a peculiar fragrance to tea. All the teas which have what is called the *cowslip flavour* owe it to this plant.

**CHLO'RIC ACID** ($ClO_5$) is a compound of one atom of chlorine and five atoms of oxygen, and is generally met with in combination with potash, as the white crystalline salt, chlorate of potash ($KO,ClO_5$). This salt is mainly interesting from the readiness with which it parts with its oxygen to combustibles, as when thrown on red-hot charcoal, when it causes violent deflagration. The salt is employed in the fabrication of certain kinds of lucifer-matches, which give a slight explosion when struck. If a crystal of chlorate of potash be placed on a piece of paper saturated with turpentine, and a drop or two of oil of vitriol added, it causes the inflaming of the turpentine with explosive rapidity. The chlorate of potash is also used in medicine, with the view of imparting oxygen to the blood.

**CHLORI'METRY**, or **CHLORO'METRY**, is the process of estimating the proportion of available chlorine in bleaching powder (q. v.), which may vary from 20 to 36 per cent. The process depends upon the great power with which chlorine, in the act of being liberated from its compounds, causes the oxidation of many substances. The salt generally used is pure crystallised sulphate of iron, which, in its ordinary state, gives a deep blue colour, with a drop of ferridcyanide of potassium, but ceases to do so when it has been fully oxidised, or converted from a proto-salt into a per-salt, through the influence of chlorine. It being known that 78 grains or parts of sulphate of iron are oxidised by 10 grains or parts of chlorine, the mode of procedure in C. is as follows: 78 grains of fine crystals of the sulphate of iron are dissolved in water slightly acidulated with hydrochloric acid in a white porcelain basin. A given quantity of the bleaching powder—say 50 grains—is dissolved in a little tepid water, and introduced into a tall measure-glass called a chlorimeter or burette (figs. 1, 2, and 3), similar to an alkalimeter, which is divided into 100 parts, and water added till the solution rises to the top mark. After subsidence of the insoluble matter, the clear solution is very gradually poured into the solution of sulphate of iron in the basin, the whole being kept constantly stirred, and every now and again a drop of the iron solution is taken out and placed on a new drop of ferridcyanide of potassium placed on a white plate; and whenever the iron solution ceases to produce a deep blue, and only forms a light greenish-yellow tint, it is known that the iron has been fully oxidised by the chlorine. Suppose that at this stage the burette has been emptied to the 55th division; as we know that the liquid poured out must have contained 10 grains of chlorine, we can calculate the chlorine contained in the whole; for



Burettes.

55 : 10 : : 100 : 18·18.

Thus 50 grains of the powder contain 18·18 grains of chlorine, or 36·36 per cent. Protochloride of manganese, subchloride of mercury (calomel), or a solution of indigo of known strength, may be employed instead of the sulphate of iron; but the latter is preferable, and is generally employed by chemists and manufacturers.

**CHLO'RINE** (Gr. *chlōros*, pale green) is a non-metallic element discovered by Scheele in 1774, and named by him *dephlogisticated marine air*. Afterwards, in 1810, Davy proved it to be an elementary body, and gave it the name which it now bears. In nature it is always found in a state of combination. United with sodium (Na), it occurs very largely as the chloride of sodium (NaCl)—common salt—in the ocean; in large beds, as rock-salt; in all natural waters, including even rain-water; in clays, soils, limestone; in volcanic incrustations; and in the vegetable and animal kingdoms. The preparation of gaseous C. by its liberation, directly or indirectly, from common salt, has been fully described under Bleaching Powder, which is the form in which C. is prepared and employed commercially. For experimental purposes, the gas may be received in jars filled with water at the pneumatic trough, when the C. rises into the jar, and displaces the water. When thus obtained, it is a yellowish-green gas with a peculiar and suffocating odour, is not combustible, and a very feeble supporter of ordinary combustion. A lighted candle placed in it burns with a very smoky flame, owing to the hydrogen of the oil alone burning, and the carbon being liberated. Several of the metals, such as antimony, copper, and arsenic, in a fine state of division, or in the condition of thin leaves, at once become red hot, and burn when introduced into the gas. A piece of thin paper soaked in turpentine likewise bursts into flame. C. has the symbol Cl, and the atomic weight or equivalent of 35·5. It is a very heavy gas, nearly $2\frac{1}{2}$ times heavier than air, its specific gravity being 2470 (air = 1000); it is soluble in cold water to the extent of two volumes of C. in one of water, and yields a solution resembling the gas in colour, odour, and other properties. The principal properties of C. are those of a bleacher of cotton and linen (see Bleaching), and a most powerful disinfectant (q. v.). The gas can be condensed by pressure and cold into a transparent dark greenish-yellow limpid liquid, with a specific gravity of 1330 (HO = 1000), which also possesses bleaching properties, and a most powerful odour. On the animal system C. acts, in very minute quantity, by producing a sensation of warmth in the respiratory passages, and increasing the expectoration; in large quantity, by causing spasm of the glottis, violent cough, and a feeling of suffocation. The workmen in chemical manufactories, who get accustomed to the C. in small quantity, are generally stout—at least, lay on fat—but complain of acidity in the stomach, which they correct by taking chalk, and also suffer from the corrosion of their teeth, which are eaten away to stumps. The antidotes to the evil effects of the introduction of C. into the lungs are the inhalation of the vapour of water, alcohol, ether, or chloroform; but the two latter should never be resorted to except under medical supervision.

C. unites with the metals and many other substances to form an extensive class of salts known as *chlorides*.

**CHLO'RITE** (Gr. *chlōros*, green), an abundant mineral, consisting of silica, alumina, magnesia, and protoxide of iron, in somewhat variable proportions. It is of a green colour, rarely occurs crystallised in hexagonal crystals, sometimes foliated like talc. It is rather soft, and is easily broken or scratched with a knife. Before the blowpipe, it is with difficulty fused on thin edges. It is readily distinguished from talc by yielding water in a closed tube.

**CHLO'RITE-SCHIST**, or **CHLORITE-SLATE**, a green slaty rock, in which chlorite is abundant in foliated plates, usually blended with minute grains of quartz, and sometimes with felspar or mica. It belongs to the metamorphic rocks, and is often found graduating into gneiss and clay-slate.

**CHLO'ROFORM**, or the **TERCHLO'RIDE OF FO'RMYLE** ($C_2HCl_3$), was originally discovered by Soubeiran, and experimented upon by Dumas, and was long known only to scientific chemists as a rare organic body, possessing interest from being one of a series of organic substances, but not known to possess any properties likely to call it into use, or even likely to let it be known by name to the general public. The remarkable power, however, which it possesses of producing anæsthesia, has led to the preparation of C. on a very extensive scale. The materials employed are alcohol, water, and bleaching powder, and the proportions are four parts of bleaching powder, to which sufficient water is added to make a thin paste, and thereafter one part of spirits of wine; the whole is introduced into a capacious retort, which must not be more than half filled, and heat being applied, the C., accompanied by water and a little alcohol, distils over. As the C. is heavier than water, and is not readily miscible therewith, two layers of liquid are obtained in the receiver—the upper being water and alcohol, and the lower being chloroform. The upper liquid being cautiously poured off, the C. is agitated with fused carbonate of potash, which abstracts the remaining traces of water, and on subsequent redistillation the C. is obtained pure and ready for use.

C. is a highly limpid, mobile, colourless liquid, which is very volatile, has a characteristic and pleasant odour, and an agreeable sweetish taste. It has a specific gravity of nearly 1500 (water = 1000), being thus half as heavy again as water, and boils at 140° F. It is not inflammable in the ordinary sense of the term, as it will not take fire when a light is brought down upon it; but when thrown on red-hot coals, it burns with a green flame, evolving much smoke. It is slightly soluble in water, but more readily mixes with alcohol and ether. It dissolves camphor, amber, copal, and other resins, wax, caoutchouc, black and red sealing wax, iodine and bromine, as well as strychnine and other alkaloids. Its purity may be determined by placing some on the palm of the hand, and allowing it to evaporate, when no alcoholic or other odorous substance should be even momentarily recognised; and by agitation with oil of vitriol, when, on settling, the C. should readily swim on the surface of the vitriol, and the two layers of liquid remain colourless. The employment of C. as an anæsthetic has already been considered under ANÆSTHESIA; but it may be here repeated, that C. is a substance that cannot be too cautiously dealt with, and that it should never be administered except in the presence and by the sanction of a medical practitioner. When skilfully given, it is the safest of all anæsthetics, and the greatest boon that chemistry has bestowed on suffering humanity.

**CHLO'ROPHYLL** (Gr. *chlōros*, green, and *phyllon*, a leaf), the substance to which the leaves and other parts of plants owe their green colour. It is somewhat analogous to wax, is soluble in alcohol and ether, but insoluble in water, and floats in the fluid of the cells, in the form of minute granules. Light is indispensable to its formation, and hence arises the familiar phenomenon of Blanching (q. v.), either from accidental causes, or by the art of the gardener. Young leaves do not exhibit so deep a green as those which have been longer exposed to the light; and the green of a leaf generally deepens till it begins to change into the tints of autumn. *Hydra viridis*, and other minute animals, appear to owe their green colour to a substance analogous to chlorophyll.

**CHLO'ROPS.** See CORN-FLY and WHEAT-FLY.

**CHLORO'SIS** (Gr. *chlōros*, pale green), a peculiar form of anæmia or bloodlessness, common in young women, and connected with the disorders incident to the critical period of life. It has been called the *green sickness*, from the peculiar dingy greenish-yellow hue of the complexion; the green colour, however, is not always characteristic. The disease is attended with very great debility, and often with breathlessness, palpitation, and other distressing, or even alarming symptoms. When there is no organic disease present, however, C. may be pronounced curable in a large proportion of cases. The principal means to be employed are air, exercise, often salt-water baths, the use of iron, with a nutritious and rather stimulating diet, and purgatives if required; together with such special remedies as are adapted for restoring deficient secretions, and bringing the entire female system of organs into a natural condition.

**CHLORO'SIS**, a diseased state of plants, in which a sickly green or greenish-yellow colour takes the place of the natural lively hue. Sometimes only a particular shoot is affected by it, but very generally the whole plant; and it seems to depend upon causes which render the plant altogether unhealthy, the pallid appearance being merely symptomatic, and not only the formation of chlorophyll, but all the functions of vegetable life being languidly and imperfectly carried on. Bad seed, damp soil, and cold wet weather, appear to be the most common causes of chlorosis. Plants affected by this disease are often to be seen among crops generally healthy; but whole crops of grain, potatoes, &c., sometimes perish from it, or are much diminished in value. Fruit-trees also suffer from it.

**CHOCARD**, or **CHOQUARD** (*Pyrrhocorax*), a genus of birds of the Crow family (*Corvidæ*), differing from the Choughs in having a shorter bill, which, however, is arched like theirs, but resembling them in their habits. The only European species is the Alpine C., also called Alpine Chough, and Alpine Crow (*P. Pyrrhocorax*). It is about the size of a jackdaw, of a brilliant black, with yellowish bill and red feet.

**CHOCKS** are pieces of wood employed on ship-board to aid in the support of various articles. Amongst them are anchor-chocks, rudder-chocks, boat-chocks, stow-wood chocks, and chocks to support the ends of the beams.

**CHO'CO**, a bay and province of New Granada, in South America.—1. The bay, forming part of the Gulf of Darien, receives the Atrato (q. v.), a stream of note in connection with inter-oceanic communication. Its lat. and long. are about 3° 30′ N., and 77° 30′ W.—2. The province forms the west portion of the department of Cauca (q. v.).

**CHO'COLATE** is made from the seeds of *Theobroma Cacao* (see COCOA), reduced to a fine paste in a heated iron mortar, or by a machine, and mixed with pounded sugar and spices, as cinnamon, cloves, cardamom, vanilla, &c. The paste is then poured into moulds of white iron, in which it is allowed to cool and harden. C. is sometimes made without spices, but is then more generally called Cocoa. The paste is sometimes mixed with flour, and with Carrageen or with Iceland Moss; and for medicinal purposes with cinchona, &c. C. is used as a beverage, and for this purpose is dissolved in hot water or milk. Sometimes the yolk of an egg is added, and sometimes it is dissolved in soup or wine. It is also employed in making certain liqueurs. In a pure state, it soon satisfies the appetite, and is very nourishing; when it contains spices, it is also stimulating. Good C. is externally smooth, firm, and shining—not gritty in the fracture—easily soluble, aromatic; not viscid after having been liquefied and cooled, but oily on the surface, and leaves no sediment of foreign substances. C. is adulterated in many ways, by mixing it with rice-meal, oatmeal, flour, potato-starch, roasted hazel-nuts or almonds, and with benzoin, storax, &c., in place of vanilla. The Mexicans, from time immemorial, were accustomed to prepare a beverage from roasted and pounded cocoa, dissolved in water, and mixed with maize-meal and spices. This they called Chocolatl (*choco*, cocoa, and *latl*, water). From the Americans, the Spaniards derived an acquaintance with C., and by them it was introduced into Europe in 1520. C. is used in South America, Spain, and Italy, more than in other parts of the world, although it is used to a considerable extent in Germany. Its use in Britain has given place in a great measure to that of the simpler cocoa.

**CHOCOLATE ROOT.** See GEUM.

**CHOIR** (Lat. *chorus*). In its literal sense, the C. is the portion of the church devoted to the singers; and in all descriptions which concern the ritual it is so limited, including only the space from the western door or screen to the end of the stalls, whilst the part from the stalls eastward to the high-altar is called the presbytery. But in ordinary language, and even as used by architects, it denotes the entire space which is enclosed for the performance of the principal part of the service. In this sense, it includes the C. proper and the presbytery, and corresponds to the chancel in parish churches. Where the church is cruciform, and the term is confined to the eastern limb, it comes to be entirely different from the C. in the ritual sense, or the stall-place, which in such a building is commonly situated either under the tower or in the nave. In large churches, the aisle generally runs along each side of the C., and frequently passes across the east end of it; an arrangement which is very common in the larger churches of the continent which have polygonal or semicircular terminations.—C. is also the name given to the singers of the choral service.

**CHOIR-SCREEN**, or **CHOIR-WALL**, the screen or wall which divides the choir and presbytery from the side aisles. It is often very richly ornamented.

**CHOISEUL-AMBOISE**, Etienne François, Duc de, minister of Louis XV., was born June 18, 1719, educated by the Jesuits, and on the completion of his studies, entered the army. He fought bravely in the Austrian Wars of Succession; but only after he had attracted the fancy of the king's mistress, Madame Pompadour, did fortune also really favour him. Through the influence of Madame Pompadour, he was made lieutenant-general in 1748, ambassador to the courts of Rome and Vienna in 1756, and Duc de Choiseul in 1758. C. now became instrumental in bringing about a family league of the Bourbon monarchs in Europe; and in 1763, at the close of the war so disastrous to the French arms, he obtained, by his prudence and dexterity, milder terms for his nation than had been expected. This made him very popular, as did also his successful attempt to overthrow the Jesuits. In 1764, Madame Pompadour died, but the power of C. continued unabated. He conceived, and almost carried out, a plan for the formal emancipation of the Gallican Church from papal influence, paid great attention to the improvement of the army and navy, developed the trade and industry both of the nation and of the colonies, and opened up anew an intercourse with India, whose native princes were assisted by French officers in their endeavours to expel the British from the peninsula. He had spies in every European court, and so ruled all diplomatic and political cabals, that the Empress of Russia, who dreaded him, called him *Le Cocher de l'Europe* ('The Driver of Europe'). But the rise of Madame Dubarry, who succeeded Madame Pompadour in the royal affections, gradually alienated Louis from his able minister, and in 1770 he retired to his magnificent estate of Chanteloup, where he lived in princely splendour. After the accession of Louis XVI., C. received permission to return to Paris. He was often consulted, but never recovered his official position. He died May 7, 1785.

**CHO'KE-CHERRY**, a name given to certain nearly allied species of Cherry (q. v.), of the Bird-cherry section of the genus or sub-genus, natives of North America, having small fruit in racemes, and the fruit at first rather agreeable, but afterwards astringent in the mouth. Some confusion has long existed as to the different kinds, and their botanical names (*Prunus* or *Cerasus Virginiana, serotina*, and *borealis*) are not more determinate than the popular ones. Perhaps they ought to be regarded as mere varieties rather than distinct species. They have a considerable resemblance to the Portugal Laurel, although the leaves are deciduous. The bark is used as a febrifuge and tonic, under the name of *Wild Cherry Bark;* and by distilling it with water, a volatile oil is obtained from it associated with hydrocyanic acid, called *Oil of Wild Cherry*. This bark allays nervous irritation, and is particularly suitable as a first tonic in cases of recovery from fever or inflammation.

**CHO'KE-DAMP.** See Carbonic Acid.

**CHOKING**, the obstruction of the gullet, or of the passage leading to it, by morsels of food imperfectly chewed, or other substances accidentally swallowed. The consequences of C. in the human subject are serious, and will be best considered in connection with the parts concerned. See Pharynx and Œsophagus. What follows relates to the C. of cattle.

*Causes.*—These may be classified under two heads: 1. Those that depend on the material swallowed; and 2. Those that depend on the animal swallowing. Under the first head we find sharp-pointed objects which become fixed into or entangled in the membrane lining the throat and gullet; solid masses too large to pass on to the stomach; dry farinaceous materials which clog in the passage. The second class of causes consists in inflammation of the throat, or irritation of the organs of deglutition; constrictions of the passage, as in crib-biting horses; ulceration of the œsophagus, which is apt to run after C., and is the cause of a relapse; lastly, without any disease of the deglutating organs, an animal may be choked by eating too greedily, and imperfectly masticating or salivating its food.

*Symptoms.*—These vary according to the position of the obstruction. If high up in the pharynx, the animal cannot swallow, evinces great distress, and attempts to cough up the object. Saliva drivels from the mouth, the animal chews, and makes an occasional ineffectual effort to swallow. The breathing is very greatly disturbed. In some cases a large lump of food has become fixed in the larynx or upper part of the windpipe, and has suddenly suffocated the animal. When the obstruction is in the course of the gullet down the neck, the symptoms are very similar, though less urgent, and there is additionally the local sign of swelling, with the peculiar hardness or softness of the substance indicating its nature. When an animal is choked by a substance lodging in the gullet within the chest, the symptoms are more mysterious, and likely to mislead. The animal swallows; a considerable quantity of liquid may enter the gullet, but it is suddenly regurgitated or thrown up, as in the act of vomiting. The distress is great; and in the course of three or four days, unless the animal is relieved, it dies of prostration. In the ox, sheep, and goat, the most alarming symptoms, in any case of C., arise from the paunch becoming distended by gas. This condition will be treated under the head Hove.

*Treatment.*—Remove the obstruction with the hand, when you can. Cause the animal to swallow the substance, if possible, by giving it water or oil. Carefully push the offending agent down by a probang, if it is possible to effect this, and if withdrawal by the mouth is impracticable. In some cases, the gullet has to be cut into by a qualified surgeon. After a case of C., keep the animal on soft food, and attend to its general health, in order to avoid a relapse, which is of frequent occurrence in cattle.

Probang.

**CHO'LERA**, a Greek term used in the Hippocratic writings, but of indeterminate etymology, being derived perhaps from *cholē*, bile, or from *cholera*, a water-spout or gutter. It is now universally employed in medicine as indicating one of two or three forms of disease, characterised by vomiting and purging, followed by great prostration of strength, amounting in severe cases to fatal collapse. The variety called *cholera sicca* (dry C.) by ancient writers (in which collapse and death take place without discharges) is comparatively rarely observed. The milder forms of C. occur almost every summer and autumn, even in temperate latitudes, and are hence termed by some—in reference to this country, and by way of contrast—British or Summer C.; while the more devastating and fatal forms of the disease are generally supposed to originate only in tropical countries—especially in India—and thence to be propagated epidemically over vast populations, and in a somewhat regular geographical course, reaching this country usually through Persia, the steppes of Tartary, Russia, and the Baltic, at the same time extending to Egypt, Turkey, and the south of Europe. These very fatal forms of the disease are commonly called Asiatic, Oriental, or Epidemic C.; sometimes Cholera Morbus, or Pestilential Cholera. The milder forms are sometimes also called Bilious C.; and the severer, Spasmodic C., from the character of the symptoms in each. Some writers of great authority are inclined to consider the two forms as one disease, varying in individual cases and according to season. It is certain that it is not always possible to distinguish the one form from the other in particular instances; but the marked difference between the mortality of groups of cases of British C. on the one hand, and of Oriental or Asiatic C. on the other, renders it probable that there is something in the latter disease which amounts to a distinction in kind. Whether in the milder or severer form, C. is usually ushered in by a period of premonitory symptoms, when the more distinctive characters of the disease are not established, the case resembling one of common diarrhœa (q. v.) or looseness of the bowels. At this stage, it is very apt to be neglected, and unfortunately, in the severer epidemic forms of the disease this is the only stage much under control. Whenever, therefore, there is a reasonable suspicion that Epidemic C. is threatened, every person attacked with diarrhœa should make a point of placing himself under medical advice, and, if possible, of escaping from any situation in which epidemic disease is known to be prevalent. He should also be particularly attentive to diet, and especially to the purity of the water he drinks, and to its absolute freedom from contamination by animal matters filtering through the soil, or thrown into water-courses by sewers, &c. If water absolutely cannot be had in a pure state, it should be boiled before being used for drink, or indeed for any domestic purpose. Many cases of C., and several local epidemics, have been traced in the most positive manner to organic impurities of the drinking-water; and no single cause of the disease has been established by so much evidence as this. Hence, in all probability, arises the well-known preference of C. for low situations, and particularly for the low-lying flats on the banks of rivers, especially where the inhabitants are supplied with water from streams polluted by sewerage, and wells into which the contents of drains are permitted to filter from a superior elevation.—See Dr Snow's work on the Communication of Cholera, 2d edition, 1855; also the Report of the Registrar-general of England on the Cholera of 1848—1849, and his 17th Annual Report, for 1854.

It is hardly within the scope of a work such as this to present a minute description of fully developed C. in its severer or Asiatic variety. It is truly an appalling pestilence,* too easily recognised by a few leading features. After some hours or days of simple relaxation of the bowels, vomiting commences, and occurs again and again, accompanied by frequent and extremely copious discharges downwards, at first of matters coloured with bile as usual, but in the end of colourless and turbid fluid resembling water in which rice has been boiled. These discharges (often to the extent of gallons of liquid), succeeding each other with the most alarming rapidity, act as a drain upon the fluids of the body generally; and by the changes they effect upon the blood, contribute to bring about the state called *collapse*. In this condition, the patient lies motionless and apathetic, except when tormented by cramps, which are of frequent occurrence; the surface is cold; the finger-ends, lips, and tip of the nose become livid; the eyes are deeply sunk in the sockets, and often bloodshot; the tongue is clammy; the breath without any sensible warmth when caught on the hand; the pulse is suppressed at the wrist, the breathing extremely slow and feeble, the heart just audible through the stethoscope. Purging and vomiting have ceased; even the urinary secretion is dried at its source. In fact, all the vital processes are nearly brought to a stand, and unless reaction comes, a few minutes, or at most a few hours, suffice to bring life to a close. Reaction in the most favourable cases is gradual and without accident; it is not unfrequently, however, accompanied by fever, closely resembling typhus, and constituting, at least in the temperate zone, one of the chief dangers of the progress of cholera.

Medicine is almost powerless against C., except in the earliest stages, in which the treatment usually pursued in diarrhœa (q. v.) has sometimes been found useful. Very remarkable temporary restorative effects have been found to follow the injection into the veins of dilute solutions of saline matter, resembling as nearly as possible the salts of the blood which are drained away in the discharges. Unhappily, these experiments have as yet only very imperfectly succeeded. The patient is restored to life, as it were, from the very brink of the grave; but he revives only for a few hours, to fall back into his former condition.

The true medicine of C., so far as we yet know, is preventive medicine. The measures to be adopted have been partly pointed out above; in addition, it may be said that personal cleanliness is of the first importance; and that all unnecessary contact with the sick should be avoided, as the disease is probably to some extent contagious, though by no means in the highest degree. In short, all the precautions are to be taken which are recommended in the case of Epidemic Disease (q. v.).

**CHOLE'STERINE** is one of those bodies which are termed by chemists lipoids, or non-saponifiable fats. It was originally discovered in gall-stones, but is now recognised as an ordinary constituent (although occurring in very minute quantity) of bile, blood, and the tissue of the brain. It likewise occurs in pus, the contents of cysts, and other morbid fluid products.

It separates from its solutions in glistening nacreous scales, which, when examined under the microscope, appear as very thin rhombic tablets, whose obtuse angles are 100° 30′, and whose acute angles are 79° 30′. Different formulæ have been assigned

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* The epidemic of 1848—1849 carried off 53,293 persons in England and Wales; and that of 1854, 20,097 persons. See the Registrar-general's Report for the latter year. This estimate is exclusive of cases of fatal diarrhœa.

for its composition, the one generally accepted being $C_{37}H_{32}O$. It is not always very easy of detection in animal fluids, but if, by its insolubility in water, acids, and alkalies, and its solubility in hot alcohol and ether, it has been recognised as a fatty substance, it may be readily distinguished from all similar substances by the measurement of the angles of its rhombic tablets. The best method of preparing C. is by boiling gall-stones containing it in alcohol, and filtering the solution while hot. From this hot filtered solution it crystallises as the fluid cools.

Chemists have obtained substances known as *cholesterilins* and *cholesterones* from the decomposition of cholesterine.

**CHOLET**, a town of France, in the department of Maine-et-Loire, on the right bank of the Maine, 32 miles south-west of Angers. Here, during the Vendean war, two actions were fought in 1793, in both of which the royalists were defeated. In the first, they lost their brave general Bonchamps; and the second drove them across the Loire, thus virtually deciding the war against them. It has manufactures of fine woollen and mixed fabrics, and leather, and a trade in cattle. Pop. 9638.

**CHOLU'LA**, a once flourishing, but now decayed, town of Mexico, 60 miles to the east-south-east of the capital, and 15 to the west-north-west of La Puebla. Cortes found in it 20,000 houses, and as many more in the suburbs, and also 400 temples. Now the place contains only about 10,000 inhabitants. Its most remarkable memorial of aboriginal times is a pyramid of clay and brick, surmounted on the top by a chapel of Spanish origin. Its height is 177 feet, while the side of its base measures 480 yards. C. stands on the table-land of Anahuac, at an elevation of 6912 feet above the level of the sea.

**CHO'NDA**, a town of Gwalior, 18 miles to the north-west of the fort of the latter name, in lat. 26° 27′ N., and long. 78° E. It claims notice merely as the scene of a decisive victory gained by Sir Hugh, afterwards Lord Gough, over the Mahrattas, on 29th December 1843.

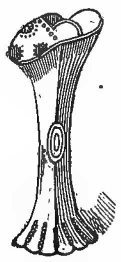
**CHO'NDRINE.** See Gelatine.

**CHONDROPTERY'GII.** See Cartilaginous Fishes.

**CHO'NETES**, a genus of fossil brachiopodous mollusca, nearly allied to the well-known genus *Productus*. It is characterised by its transversely-oblong shell, and by having the long margin of the ventral valve armed with a series of tubular spines. Twenty-nine species have been described from the Palæozoic formations.

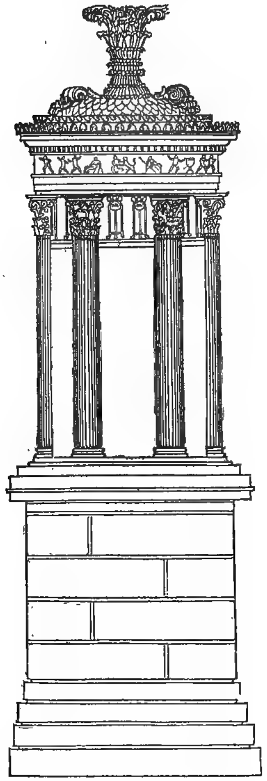
**CHO'NOS ARCHIPELAGO**, a group of islands lying off the west coast of Patagonia, South America, in lat. 44°—46° S., and long. 74°—75° W. With the exception of a few of the most westerly, all are bare and scantily peopled, though several of them are of considerable extent.

**CHO'PIN** (Scotch, *chappin*), the name of a Scotch liquid measure equivalent to the English quart.


Chopine.

**CHO'PINE** (Spanish, *chapin*), a high clog, or slipper, deriving its name, as is supposed, from the sound *chap*, *chop*, made by the wearers in walking. Chopines were of Eastern origin, but were introduced into England from Venice during the reign of Elizabeth. They were worn by ladies under the shoes, and were usually made of wood covered with leather, often of various colours, and frequently painted and gilded. Some of them were as much as half a yard high; and in Venice, where they were universally worn, their height distinguished the quality of the lady. The C. is mentioned by Shakspeare in *Hamlet*. The accompanying representation of a C. is copied from Douce's *Illustrations of Shakspeare*.

**CHORA'GIC MONUMENTS.** The choragus or person at Athens who, on behalf of his tribe, had supported the chorus (q. v.), and who, in competition with the other tribes, had exhibited the best musical or theatrical performance, received a tripod for a prize; but he had the expense of consecrating it, and of building the monument on which it was placed. There was at Athens a whole street formed by these monuments, called the 'Street of the Tripods.' The figure represents the monument of Lysicrates, popularly known as the 'Lantern of Demosthenes.'

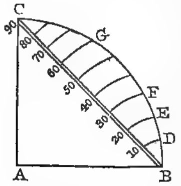

Choragic Monument of Lysicrates in Athens, restored.

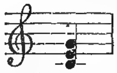
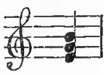
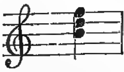
**CHO'RAL MUSIC**, the ancient music of the church. Music in parts for different voices. See Sacred Music.

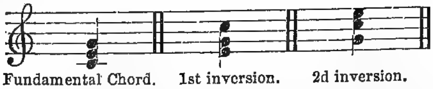
**CHORAL SERVICE**, the musical service of the English Church, celebrated by a full complement of clergymen and choristers in a cathedral church, and when all those parts of the service are sung as ordered in the rubrics.

**CHORA'LÉ**, a musical term adopted from the German, means a melody to which sacred hymns or psalms are sung in public worship by the whole congregation in unison. The melody of the C. moves in notes of a slow and strictly measured progression, and of a solemn and dignified character that disposes the mind to devotion. Although the term C. is now always applied to the music of the Protestant Church, it belonged to the Christian Church at all times, as melodies still in use can be traced with certainty to have been sung by the congregations in the first centuries of Christianity. Among these is the song of praise by St Ambrose, still retained in the Lutheran Church, to the words 'Herr Gott, dich loben wir.' The C. is intimately connected with the history of music, as vocal music was the only kind used in worship until far on in the middle ages. The C. is precisely what our psalm-tune is, or rather what it formerly was, and ought again to become. The pure, simple C. has, in a great degree, been cast aside in the British Isles, and its place occupied by tunes of a comparatively puerile style, which are frequently only adaptations of operatic songs and other profane pieces.

**CHORD.** The C. of an arc of a curve is a straight line joining its two extremities. A Scale of Chords is used in laying off angles. It is thus constructed: Let AB be the radius of the circle to which the scale is to be adapted. With centre A and radius AB describe a quadrant BEC. Divide the quadrantal arc BEC into nine equal parts BD, DE, &c. This may be done by taking a radius equal to AB, and from the centres B and C cutting the arc in G and F. As the radius is always equal to the chord of 60° or $\frac{2}{3}$ of a quadrant, the arc CB is thus divided into three equal parts, BF, FG, GC, and each of these parts may then be trisected by trial, as no direct method is known. Draw the chord of the quadrant BC; from B as a centre, and the chord of BD as a radius, describe an arc cutting BC at 10; with the chord of BE as a radius, describe an arc cutting BC in 20; with the chord of BF, describe an arc cutting BC in 30; and in a similar manner, find the divisions 40, 50, 60, 70, 80. Then the arcs BD, BE, BF, being arcs of 10°, 20°, 30°, &c., respectively, the distances from B to 10, 20, 30, &c., are the chords of arcs of 10°, 20°, 30°, &c.; so that BC is a scale of chords for every 10°, from 0° to 90°. To lay down or measure angles with such a scale, the arc of measurement must be described with the chord of 60°.

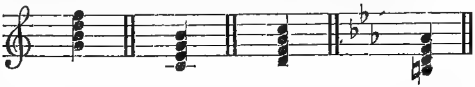


**CHORD**, in Music, is the simultaneous and harmonious union of different sounds, at first intuitively recognised by the ear, and afterwards reduced to a science by the invention of the laws or rules of harmony. See Harmony. Chords may consist of from two to five parts. Absolute chords of two parts are produced only by thirds or sevenths. Chords of more than two parts are either fundamental chords or inversions of them, and are divided into concords and discords. The union of sounds in all chords will be found, on analysing their component parts, to be an admixture of major and minor thirds. The common chord, or *Trias harmonica perfecta*, is the basis of all harmony, and consists of a bass note, or prime, with its third and fifth above, thus:  These three sounds are at the distance of a third from each other. When the lowest third is the greater third, as above, the C. is a major chord; but when the lowest third is the lesser, thus: , the C. is called a minor chord. A chord of two minor thirds combined is called diminished, as the interval from the lowest note to the highest is less than a perfect fifth, thus: . The common C. admits of two inversions, according as one or other of its notes is made the bass, or lowest note of the C., thus:



Fundamental Chord. 1st inversion. 2d inversion.

By adding another third above the common C., a C. of four parts is produced, which is called the chord of the seventh, because the highest note is a seventh above the bass. When the C. of the seventh is produced on the fifth of the scale, it is then called the dominant seventh, which is the most perfect species of the C. It then consists of a major third, perfect fifth, and seventh, the minor, which is the next harmonic produced by nature above the fifth. The C. of the seventh may also be formed on any of the notes of the major or minor scale taken as a bass note, which produces the varieties of major, minor, and diminished sevenths, thus:



Dominant 7th. Major 7th. Minor 7th. Diminished 7th.

The C. of the seventh admits of three inversions, according as the notes above the fundamental note are used as bass notes. From its nature, it requires a resolution, and is therefore always followed by a common C. whose fundamental bass is a fifth below that of the seventh. For the C. of the ninth, see Harmony. The first proper arranged system of chords is by Rameau, in 1720, which has from time to time been extended and improved by Marpurg, Kirenberger, G. Weber, F. Schneider, Marx, and the late Professor S. W. Dehn of Berlin.

**CHORE'A** (Gr. *choreia*, a dancing or jumping), a disease popularly called St Vitus's Dance, and consisting of a tendency to involuntary and irregular muscular contractions of the limbs and face, the mind and the functions of the brain generally being quite unaffected. The spasms of C. differ from those of most other convulsive affections in being unaccompanied either by pain or by rigidity; being, in fact, momentary jerking movements, indicating rather a want of control of the will over the muscles, than any real excess of their contractions. In some cases, the disease resembles merely an exaggeration of the restlessness and 'fidgetiness' common among children; in others, it goes so far as to be a very serious malady, and may even threaten life. Fatal cases, however, are fortunately very rare, and in the large majority of instances the disease yields readily to treatment carefully pursued, or disappears spontaneously as the patient grows up. C. is a disease much more common among children of six years old, and upwards, than at any other period of life: it is also more common among female children than among males. The treatment generally pursued is the use of metallic tonics, such as zinc, copper, iron, and arsenic (the last, perhaps, the best), sometimes preceded or accompanied by purgatives. Exercise in the open air is also to be recommended; and gymnastics afford material aid in the cure. It is to be observed that the name St Vitus's Dance (Dance of St Weit) was applied originally in Germany to a different form of disease from that above referred to—one closely approaching in its characters the epidemic 'dancing mania,' which, in Italy, was called Tarantism (q. v.).

**CHO'RLEY**, a town in Lancashire, on a hill on the Chor, 9 miles south-south-east of Preston. It has an ancient parish church, supposed to be of Norman origin, and manufactures of cotton-yarn, jaconets, muslins, fancy goods, calicoes, and ginghams. In the vicinity are several coal-mines, a lead-mine, besides mines and quarries of iron, alum, slates, millstones, &c. Pop. in 1851, 8907.

**CHO'RUS**, among the ancients, meant a band of singers and dancers employed on festive occasions of great pomp, and also in the performance of tragedy and comedy on the stage. In the time of the Attic tragedy, the C. consisted of a group of persons, male and female, who remained on the stage during the whole performance as spectators, or rather as witnesses. When a pause took place in the acting, the C. either sang or spoke verses having reference to the subject represented, which served to increase the impression or sensation produced by the performers. At times, the C. seemed to take part with or against the persons in the drama, by advice, comfort, exhortation, or dissuasion. In early times, the C. was very large, sometimes consisting of upwards of fifty persons, but afterwards it was much reduced. Its leader was termed the Coryphæus. The charge of organising it was considered a great honour among the citizens of Athens. The person appointed for this purpose was called the *choragus.* The honour was very expensive, as the choragus had to pay all the expenses incurred in training the members of the C. to perform their parts efficiently. They were, besides, fed and lodged by him during training-time, and he had also to provide for them masks and dresses. At times, the C. was divided, and spoke or sang antiphonally. These divisions moved from side to side of the stage, from which movement originated the naming of the single songs or stanzas, such as Strophe, Antistrophe, and Epode. How the musical element of the ancient C. was constituted or composed, is not known with any certainty. Possibly, it was only a kind of rhythmical declamation, and doubtless very simple. It was accompanied by flutes in unison. With the decline of the ancient tragedy, the C. also fell into disuse; and only lately has there been an attempt to produce the same on the stage in the manner of the ancients, as, for example, in Schiller's *Bride of Messina.* The music which has been set in modern times to some of the Greek tragedies, does not give the least idea of the original music.

In modern times, by C. is understood the union of singers or musicians for the joint performance of a musical work. C. is also the name given to a musical composition for numerous voices, either with or without accompaniment, and intended to express the united feelings of a multitude. The musical C. is the only artistic means by which a simultaneous movement or sentiment of a multitude can be represented in the drama, the language or text being always of a simple rhythm, permitting only of a limited movement suited to the combination of a multitude. It is, however, not always necessary that every part of the C. should manifest the same feeling or sentiment. Two or more parts of the C. may act against each other, as suits the purport of the drama. Double, triple, and quadruple choruses are found in the old Italian compositions for the church. In modern times, the C. is much used, and with great effect, in operas, especially those of Meyerbeer and Wagner. In the oratorio, the C. is of the greatest importance, and the numbers now employed to sing the C. far exceed anything attempted a century ago; but this is not always an advantage, for the *tempi* must necessarily be taken much more slowly, which has a sluggish effect; while increase in the number of voices does not always produce a greater power of sound. The C. of thirty-five well-trained voices from the pope's chapel, who sang at the coronation of Napoleon I., in the cathedral of Notre Dame, Paris, produced a far greater and more wonderful effect when they entered singing the *Tu es Petrus*, than another C. of hundreds of voices, and eighty harps, that had been assembled and trained for the same occasion, in expectation of surpassing all that man could imagine. The greater the number, the greater is the difficulty in obtaining unity.—C., in organ-building, is the name given to stops of the mixture species, some of which contain 2, 3, 4, 5, 6, or more pipes to each note, tuned at consonant intervals in relation to the fundamental stops.

**CHOSE IN ACTION**, in the law of England, is that kind of property which consists not in possession, but in the legal right to possess.' As this right can, in general, be vindicated and made available only by means of an action, the property to which it relates, whether real or personal, is called a thing (*res* or *chose*) in action, to distinguish it from a thing already in possession. Money due upon bonds and bills, goods bought and not yet delivered, are examples of choses in action, as is also the right to compensation for damage occasioned by breach of contract. 'By the strict rule of the ancient common law, no chose in action could be assigned or granted over, because it was thought to be a great encouragement to litigiousness, if a man were allowed to make over to a stranger his right of going to law. [See CHAMPERTY.] But this nicety is now not so far regarded as to render such a transaction really ineffectual. It is, on the contrary, in substance, a valid and constant practice; though, in compliance with the ancient principle, the form of assigning a chose in action is in the nature of a declaration of trust, and an agreement to permit the assignee to make use of the name of the assigner, in order to recover possession. . . . The king is an exception to this general rule, for he might always either grant or receive a chose in action by assignment; and our courts of *equity*, making the rule itself give way to the expediency, in a commercial point of view, of facilitating the transfer of property, allow the assignment of a chose in action as freely and directly as the *law* does that of a chose in possession.'—Stephen's *Commentaries*, ii. p. 45. One would imagine that the more convenient and philosophical arrangement would be, by the interposition of the legislature, to make law conform at once to equity and expediency.

**CHO'TA NAGPO'RE, or NAGPORE THE LESS**, a district in the sub-presidency of Bengal, between lat. 22° 28′—23° 40′ N., and long. 83° 54′—85° 56′ E. It contains about 5300 square miles, and is estimated to have about 250,000 inhabitants. The country is chiefly an undulating plateau 3000 feet above the sea. Coal and iron are found, but are not worked. The natives are little better than barbarians—some of the tribes, females as well as males, going entirely naked. From the elevation of the tract, the temperature varies more considerably than in most parts of India, ranging in winter from 32° to 62°, and in summer from 78° to 98°.

**CHOTY'N, or CHO'CZIM.** See KHOTIN.

**CHOUANS** were bands of insurgent Royalists, who, during the French Revolution, organised a reactionary movement in Brittany. They obtained their name from their leader, Jean Cottereau. This person, who had been a smuggler, went by the name of Chouan—a corruption, it is said, of *chat-huant* ('screech-owl')—because, while he and his accomplices were engaged in their nocturnal work, they were wont to be warned of their danger by some one on the watch imitating the cry of this bird. At the period of the revolt, however, he followed the humble occupation of a clog-maker. The first indications of an anti-revolutionary spirit in Brittany manifested themselves in the beginning of 1791, when several trees of liberty were destroyed at night, and other more serious outrages committed. These disturbances were fomented by seditious priests. In 1792, an insurrection was planned by the Marquis de la Rouarie, with the sanction and approval of the two brothers of Louis XVI. The agents of the marquis entered into communications with Jean Cottereau—well known for the reckless audacity of his character—and other smugglers; but having the misfortune to be arrested, the carrying out of the insurrection devolved upon the latter. The *Chouanerie*, as the insurrection was called, at first disgraced itself, both by the drunken licence and the cruelty which marked it. After several successful exploits of the guerrilla sort, Jean Cottereau perished in an engagement which took place on the 28th July 1794, near the wood of Misdon, the theatre of his first efforts. Before this, however, other and more illustrious leaders had appeared in Brittany to direct the movement, the chief of whom were Georges Cadoudal (q. v.) and Charette. Through their endeavours it was more widely extended, and for a time seemed likely to imperil the security of France, but was suppressed towards the close of 1799. Petty *spurts* of insurrection, however, broke out till about 1803, when the *Chouanerie* ceased for awhile. In 1814—1815, it again made its appearance on both banks of the Loire; and after the July revolution, was once more excited by the Duchess of Berry on behalf of the Duke of Bordeaux, but crushed by the energetic measures taken by M. Thiers.

**CHOUGH** (*Fregilus*), a genus of birds of the crow family (*Corvidæ*), but approaching to the characters and appearance of the starlings (*Sturnidæ*).

Chough.

The length of the bill has induced some naturalists, among whom was Cuvier, to place them beside the hoopoes, but this is now generally regarded as an error; they agree with crows in having their nostrils covered with stiff bristles directed forward, and in their habits. The beak is longer than the head, strong, arched, and pointed. The tail is slightly rounded. The only European species is the common C., sometimes called the Cornish C., or Red-legged Crow (*F. graculus*), a widely distributed but very local bird, inhabiting the Swiss Alps, the high mountains of Spain, of Greece, of India, and of Persia, the south of Siberia, the north of Africa, and some parts of the British sea-coasts; but almost exclusively confined to situations where there are high cliffs. In these it generally makes its nest; sometimes, however, in ruined towers. Its long hooked claws enable it to cling easily to a rough rock, but it seems unwilling even to set its feet on turf. It lives in societies like the rook. It feeds on insects, berries, grubs, and grain. It is easily tamed, becomes very familiar and forward, and exhibits in the highest degree the curiosity, the pilfering disposition, and the delight in brilliant or glittering objects, which also characterise others of the crow family.—Other species of C. are known, natives of Australia, Java, &c. Some naturalists unite the chocards and the choughs into one genus.

**CHOYA.** See Chay Root.

**CHRISM** (Gr. *chrisma*, ointment) is the name given to the oil consecrated on Holy Thursday, in the Roman Catholic and Greek Churches, by the bishop, and used in baptism, confirmation, orders, and extreme unction. There are two kinds of C.—the one, a mixture of oil and balsam, is used in baptism, confirmation, and orders; the other, which is merely plain oil, is used in extreme unction.

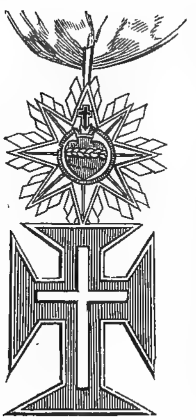
**CHRI'SOME**, the name of the white vesture laid by the priest on the child in former times at baptism, to signify its innocence. It was generally presented by the mother as an offering to the church, but if the child died before the mother was 'churched' again, it was used as a shroud. By a common abuse of words, C. came to be applied to the child itself. A C. child is a child in a C. cloth. As late as Jeremy Taylor (*Holy Dying*, c. i., s. 2), we have the following: 'Every morning creeps out of a dark cloud, leaving behind it an ignorance and silence deep as midnight, and undiscerned as are the phantasms that make a chrisome child to smile.'

**CHRIST**, a title of our Saviour (see Jesus), now in general use almost as a name or as part of his name. It is originally Greek, signifies *anointed*, and corresponds exactly in meaning and use with the Hebrew word Messiah (q. v.); so that this title given to Jesus of Nazareth, is an acknowledgment of him as the Saviour long promised to the house of Jacob and to the human race. As prophets, priests, and kings were anointed on being called to their several offices (1 Kings i. 34, 39; 1 Sam. xvi. 13; Exod. xxix. 7), so the Saviour was anointed as at once prophet, priest, and king; the Holy Spirit, often represented under this figure, being given to him to qualify his human nature for all that belonged to his mediatorial office and work.

The whole system of Christianity depends on the doctrine of the Person of Christ. An essential difference necessarily exists on almost every point between the systems of doctrine maintained by those who do and by those who do not acknowledge a union of the divine and human natures in his person. Some of the early heretics maintained an opinion, which has long ceased to have any supporters, that the body of C. was not a real body, but a mere visionary appearance. See Docetæ and Gnostics. The opposite extreme is that of Socinians (q. v.), by whom C. is regarded as a mere man; whilst Arians (q. v.) regard him as in his *pre-existence*—i. e., before his *incarnation*—the highest of all created beings; and according to the generally received doctrine of Christians, he is 'God and man in two distinct natures and one person.' This doctrine, of course, bears a most intimate relation to that of the Trinity (q. v.); and all who hold the divinity of Jesus Christ, regard him as the incarnate Second Person of the Godhead. The proof of the whole doctrine may almost be said to consist simply in a proof of the *divinity* of C.; his real *humanity*, although equally important, being no longer disputed. And this proof is found, not so much in particular texts which directly assert the divinity of C.—although such texts are important—as in the multitude of texts which imply it, and admit of no reasonable or natural explanation apart from it; and in shewing that certain doctrines are taught in Scripture which cannot be maintained without this.

The ancient Apollinarians, Eutychians, Monophysites, &c., regarded C. as having only one nature —a *compound* of the divine and human; but such a notion as that C. had only a human body, the divine nature supplying the place of a soul, is held to be subversive of the whole Christian system; and his human nature, to be real, must be viewed as consisting both of a true body and a true soul. His human nature never existed, however, apart from his divine nature, and was 'conceived by the power of the Holy Ghost.'

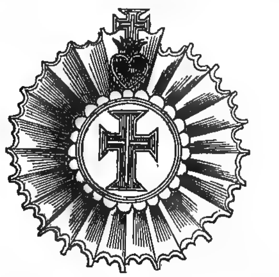
Closely connected with this subject is that of the *humiliation* and consequent *exaltation* of C., in his character of mediator between God and man; a subject, to the former branch of which belongs the whole doctrine of the *work* of C. for the redemption of sinners, including the great doctrine of Atonement (q. v.). To the latter belongs the doctrine of the reward of his work, in his sitting at the right hand of God, and having all things put under his feet; not only exercising dominion as king in his church, but over all things for the advancement of the salvation of his church, and of every member of it; while also He sends forth the Holy Spirit to apply to men the blessings which, as the reward of his work, He has mediatorially obtained for them; and still continuing to act as a priest, makes continual Intercession (q. v.), founded upon his work and sacrifice.



Badge of the Portuguese Order of Christ.

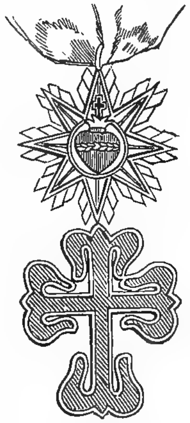
**CHRIST, Order of, in Portugal.** When the Templars were expelled from France, and their property confiscated by Philippe le Bel, with the sanction of Pope Clement V., they were received into Portugal, and their order revived in 1317, under the title of 'the Order of our Lord Jesus Christ.' With some difficulty, Pope John XXII. was induced to sanction the new order. The Knights of the Order of Christ joined the Portuguese in all their crusades against the infidel, and also in their African and Indian expeditions, receiving in compensation continual additions to their own possessions. The grand prior of the order was invested by Pope Calixtus III. with power equal to that of a bishop; and, as an encouragement to adventure, the knights were promised all the countries which they might discover, to be held under the protection of Portugal. At length, their wealth and power excited the jealousy of the kings of Portugal; their future acquisitions, and, subsequently, even their actual possessions, were declared to be crown possessions, and the offices of adminstrator and grand-master were transferred to the crown. A fine cloister belonging to the order is still to be seen at Tomar, to which place the seat of the order was transferred from Castro-Marino in 1366. Noble descent, and three years' military service against the infidel, were required for admission. The members took the three monkish vows of chastity, poverty, and obedience, till the pope released them from the first two, on condition of their applying the third part of their revenues to the support of Tomar cloister, the priests of which were bound by the three vows. This cloister is now a theological institution for the instruction of the priests of the order.

It is said that the order still possesses 26 villages and farms, and 434 prebends. It is very numerous —consisting of 6 knights of the Grand Cross, 450 commanders, and an unlimited number of knights. Catholics of noble descent alone are admitted, and foreigners are excluded from participation in the revenues, being exempted in return from its rules. The star and badge of a Knight Grand Cross are represented in the illustration.



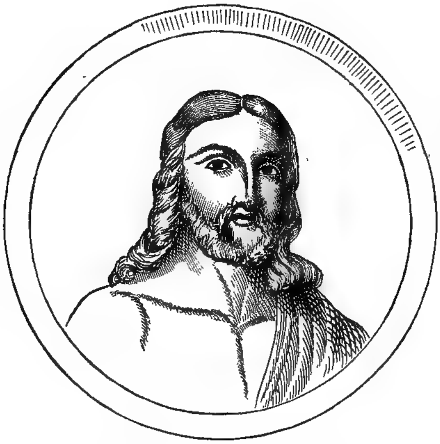
Star of the Portuguese Order of Christ.

**CHRIST, Order of, in the Papal States.** This is a branch of the Portuguese order, created by Pope John XXII. It has only one class. The decoration and star are represented in the illustration.



Badge of the Papal Order of Christ.

**CHRIST, Pictures of.** To represent the form and countenance of C. in a manner that shall even approximate to the latent ideal in the minds of men, is unquestionably the most sublime and the most difficult work which an artist can undertake. It is the highest pictorial effort of the creative faculty. From a very early period in the history of the church, we can trace the growth of the endeavour. At first, indeed, the horror entertained for the idols of the pagans, must have inspired Christians with an aversion to images or pictures of the Saviour. Gradually, however, as paganism disappeared, and time removed C. further from his people, this feeling would subside, and the longing would arise to possess some representation of him on which the eye might rest with pious delight. When Christian art originated we cannot precisely say; it is usually dated from the time of Constantine. Nevertheless—as Lord Lindsay remarks, in his *Sketches of the History of Christian Art* (Lond. 1847)—'it would be more correct to say that it then first emerged above ground; its earliest efforts must be sought for in the catacombs.' In these subterranean excavations, forming a maze of unknown extent and labyrinthine intricacy, to which the Roman Christians had recourse in the days of persecution, are to be found the first traces of Christian sculpture and painting. The *sarcophagi* of the martyrs and confessors, of the heroes and heroines, of the bishops, and, in general, of those of higher mark and renown, were painted over with the symbols and devices of Christianity. The parables were the chief source from which these sepulchral artists drew their symbols. C. is painted as the good shepherd in the midst of his flock, or, with 'pastoral pipe,' seeking the lost sheep, or returning with it on his shoulders. Sometimes he figures as an ideal youth in the bloom of his years, sometimes as a bearded man in the prime of life, sometimes as Orpheus surrounded by wild beasts enrapt by the melody of his lyre. Such pictures, however, were only *symbolical*, and did not satisfy the religious craving for a *portrait.* The age of Constantine marks the transition from the symbolical to the *pseudo-historical* picture. We now find C. represented in the midst of his disciples, or in the act of performing a miracle; but it is not till about the close of the 4th c. that we actually encounter that type of countenance which, with certain modifications, continued to rule the conceptions of artists during the whole of the middle ages. To vindicate this type, myths, at a later period, sprang into existence; and we read of a portrait of C. possessed by King Abgarus of Edessa, and imprinted on a handkerchief, and of another miraculously obtained by St Veronica at the Crucifixion; but there is as little foundation for these legends as for that which attributes to the evangelist Luke such a picture. The Emperor Alexander Severus (230 A.D.) is said to have possessed in his palace an image of Christ. An antique mosaic, probably of the 3d c., which exists in the *Museo Christiano* of the Vatican—where are to be found also some specimens of the frescoes of the catacombs—gives an idea of the manner in which the heathen artists expressed their notion of Christ. He is depicted as a bearded philosopher in profile. A letter which Lentulus, the predecessor of Pilate, is declared to have written to the Roman senate, but which is evidently apocryphal, attributes to C. a figure and countenance of manly beauty. Towards the middle of the 8th c., John of Damascus gives a description which he pretends to have gathered from more ancient authors. According to him, C. was tall, had beautiful eyes, but the eyebrows meeting; a regular nose, flowing locks, a black beard, and a sandy or straw-coloured complexion, like his mother. Among the most ancient representations of C. which profess to be portraits, are the two paintings in the Calixtine and Pontine catacombs near Rome, and which are given in Arighi's *Roma Subterranea Nova.* The Saviour is there represented with an oval visage, a straight nose, arched eyebrows, and high forehead. The expression is earnest and mild; the hair is parted on the forehead, and falls over the shoulders in waving locks; the beard is short and scattered. These two busts agree with the apocryphal letter of Lentulus, and the artist or artists who executed them, may possibly have employed it as a model. The majority of the Byzantine and Italian painters, down to the age of Michael Angelo and Raphael, adhered to this type.



Supposed earliest Picture of Christ:
From a Ceiling in the Catacombs of St Calixtus at Rome.

**CHRIST or CRIS CROSS ROW,** the alphabet arranged in the form of a cross, for the use of children; and so printed, in old 'horn' books, or primers. The letter A was at the top, and Z at the foot of the cross.

**CHRI'STCHURCH,** a parliamentary and municipal borough and seaport on the English Channel, in Hampshire, on the south-west border of the New Forest, at the head of the estuary formed by the Avon and Stour, 24 miles south-west of Southampton. It has manufactures of fusee chains for clocks and watches, and of hosiery. It has also a salmon-fishery. The priory church, one of the most interesting and magnificent of English ecclesiastical structures, was partly built on an ancient foundation by Flambard, Bishop of Durham, in the reign of William Rufus. It was altered and added to in subsequent reigns. It is now (1861) undergoing much needed restorations. A battery of artillery is generally stationed in the commodious barracks. The borough comprises two favourite watering-places, Mudeford and Bournemouth. There are traces here of a Roman temple to Mars. C. estuary and bay has a double tide every twelve hours. There is a shifting bar at the mouth, with at times only five or six feet of water. Hengistbury, or Warren Head, two miles to the south-east of C., contains a remarkable mass of ironstone in five concretionary beds. The stone is quarried and sent to Wales to be smelted. Pop. 7475. It returns one member to parliament.

**CHRIST-CHURCH,** The Cathedral of, (Oxford). This great society has had three distinct foundations. In 1526, Cardinal Wolsey obtained from Clement VII. a bull for the suppression of 22 monasteries, the site of one of which he selected as the site of a new college, to be called Cardinal College, and which he intended to endow on a scale of magnificence beyond that of any other foundation in Oxford. On the fall of Wolsey in 1529, the whole establishment came into the hands of King Henry VIII. In 1532, that prince refounded it under the name of King Henry VIII.'s College, and in 1546, he once more re-established the college, under the name of 'Christ-Church Cathedral in Oxford, or the Foundation of King Henry VIII., with a dean and 8 canons, 60 students, 40 school-boys, clerks, choristers,' &c. This foundation is now subsisting, though it has undergone considerable modifications. To none of the canonries were any duties assigned by King Henry VIII. From time to time, however, the canonries have been annexed to various university professorships, more particularly one to the professorship of divinity, by King James I.; one to the professorship of Hebrew, by King Charles I.; and one to the professorships of ecclesiastical history and pastoral theology respectively, by Queen Victoria.

Several changes were introduced by the commissioners appointed under 17 and 18 Vict. c. 81. There is now only one sinecure-enjoying canon. When he is off the list, no one may hold a canonry save a professor, the archdeacon, or the sub-dean. The studentships are now 101 in number, and are, as before, divided into junior and senior studentships, differing considerably as to emolument. All these are now open, the old system of appointment by nomination having been abolished. Three junior students are elected every year at Whitsuntide, and besides these, two are sent up yearly from Westminster. The senior studentships are also open, with the usual limitations of independent income and conformity. Of these, however, only a third can be held by laymen. The studentships were very poor; the junior about £25, the senior about £80 per annum, but an improvement in this respect has been included among the recent changes. Some valuable exhibitions, however, and 22 benefices, are in the gift of the society. In 1860, there were about 750 names on the college books. No statutes were given to C., owing to the death of the king having taken place shortly after the final foundation of the college. It is, in consequence, entirely governed by the orders of the dean and chapter, to the total exclusion of the tutors. To this separation of the governing from the teaching body, as well as to the small value of the studentships, may be ascribed, in great measure, the want of success in the schools, which has, for many years past, brought discredit on this magnificent society.

**CHRI'STENING**, a term often used as equivalent to Baptism (q. v.). It is disliked by some, and of course liked by others, as favouring the doctrine of baptismal regeneration; being, indeed, according to its derivation, expressive of the notion that a person is *made a Christian* in baptism. But, like many other terms, it is frequently employed without reference to its origin, and without any intention of conveying the opinion which it might be strictly held to imply.

**CHRI'STIAN II.**, king of Denmark, Norway, and Sweden, born at Vyborg, in the island of Funen, 2d July 1481. He ascended the throne of Denmark in 1513. Shortly after his marriage in 1515, with a sister of the Emperor Charles V., a young Norwegian peasant-girl, with whom C. was in love, died, or, as it was believed, was murdered. That natural ferocity, for which C. was surnamed the *Angry*, burst forth most furiously on this occasion. He caused the governor of the castle, Torben Oxe, the suspected murderer, to be beheaded. He afterwards declared open war against Sweden, took Stockholm through fraud, and had himself crowned king. But the cruel vengeance and treachery of C. after this event excited the indignation of that country, which, headed by Gustavus Wasa (q. v.), succeeded in driving out the Danes, liberating itself from the yoke of the House of Kalmar, and finally electing Gustavus Wasa (in 1523) to the throne. In Denmark, too, the aristocracy had risen, and an insurrection in Jütland following, C. found himself forced to flee for refuge to the Netherlands, and his uncle Fredrick I. (q. v.), the introducer of the Reformation into Denmark, elected king in his place. Encouraged, however, by the Catholic party in the Netherlands, and assisted by Charles V., C. landed successfully in Norway in 1531; but at the battle of Aggerhuus in 1532, he was totally defeated, and made prisoner in the castle at Sonderburg, from which he was liberated after twelve years of confinement. He died 28th January 1559.

**CHRISTIAN IV.**, king of Denmark and Norway, and Duke of Schleswig-Holstein, born in Zealand, 12th April 1577, and elected successor to the throne in 1580. He assumed the sceptre in 1593. From 1610 he carried on a successful war, known as the Kalmarian war, against Charles IX. of Sweden, and his successor, Gustavus Adolphus, which ended in an advantageous peace in 1613. As leader of the Protestants in the Thirty Years' War, C. was not successful. His labours for the improvement of his country, in which he was indefatigable, were, however, most beneficial. He strengthened its maritime power; extended its commerce as far as the East Indies, where he obtained the first possessions; and by restrictions upon the Hanse towns, greatly increased the inland trade of the country. His legislative and financial reforms, together with his love and patronage of the arts and sciences, gained for him the esteem of his people, especially of the learned. He died in 1648.

**CHRISTIAN VII.**, king of Denmark, son of Fredrick V. and Louisa of England, born 29th January 1749. He succeeded to the throne of his father 14th January 1766, and in the same year married Caroline Matilda, sister of George III. of England. The dissipations of his early life had enfeebled his energies, and rendered him unfit for government. The management of the state was, in consequence, seized by his ministers, with Count Bernstorff, who had possessed the entire confidence of the king's father, at their head. Bernstorff, however, was soon forced to retreat before Struensee (q. v.), who exercised unbounded influence over the king and his imprudent young queen. But innovations of a despotic tendency, and insults offered to the national feeling, soon drew upon this minister the hatred of the nation. The queen-dowager seeing this, made it an occasion for satisfying her ambitious nature, by attaching herself to the malcontents; and in 1772 she succeeded, with the assistance of her son, Fredrick (b. 1754, d. 1805), in persuading the vacillating king to draw up an order of arrest for Struensee and the young queen. Bernstorff was recalled from Hamburg. The king, who was now incapacitated by mental disease, governed only nominally. In 1784, his son, Fredrick VI. (q. v.), came to the head of the government, as joint regent with the queen-mother. C. died 13th March 1808.

**CHRISTIAN BURIAL.** See BURIAL and FELO DE SE.

**CHRISTIAN CHARITY**, KNIGHTS OF THE ORDER OF, in France. King Henry III. having instituted the order of the Holy Ghost for princes and persons of distinction, founded the order of C. C. for the support of maimed officers and soldiers, who had done good service in the wars. He assigned revenues to the order, drawn from all the hospitals in the kingdom. The knights wore on the left breast an anchored cross embroidered on white taffety or satin, with a bordeur of blue silk, and in the middle of the cross a lozenge of sky blue charged with a *fleur de lis or*. The completion of the institution was reserved for Henry IV., who placed it under the charge of the marshals and colonels of France; and by means of it, many of those who had served their country faithfully were enabled to spend the latter portion of their lives in peace, and above want. The order formed the germ of that noble hospital the *Invalides*, which was founded by Louis XIV., and which served as a model for our own hospitals of Chelsea and Greenwich. When the Invalides was founded, the order of C. C. was superseded.

**CHRISTIAN CONNECTION**, a denomination of Christians which originated about the beginning of the 19th c. in the United States of America, and is diffused over all the states. The name was assumed in avowed dislike to the acknowledgment of any human authority and to sectarian distinctions, and all doctrinal terms of communion were rejected, the Bible being adopted as the only rule of faith, and personal piety made the test of qualification for membership. The Connection soon came to consist, however, almost exclusively of persons denying the divinity of Christ.

**CHRISTIAN KNOWLEDGE**, SOCIETY FOR PROMOTING, one of the great religious associations connected with the Church of England, and the oldest of them all. It was founded in 1698, although it did not receive its present name till 1701; and had for its object: '1. To promote and encourage the erecting of charity schools in all parts of England and Wales. 2. To disperse, both at home and abroad, Bibles and tracts of religion; and, in general, to advance the honour of God, and the good of mankind, by promoting Christian knowledge, both at home and in other parts of the world, by the best methods that should offer.' These objects it has never ceased to pursue, chiefly directing its efforts to the British dominions; partaking at once of the nature of an educational association, a Missionary Society, a Bible Society, and a Religious Tract Society; and notwithstanding the operations of other great societies in these several departments of Christian benevolence, its revenue amounts to about £100,000 a year. The Protestant missionaries who laboured in the South of India in last century, were supported chiefly by this society, which has also contributed largely of its funds for the establishment of Christian schools in that country.

**CHRISTIAN NAME.** See NAME.

**CHRISTIA'NIA**, capital of Norway, is situated in the province of Aggerhuus, in a beautiful open valley on the northern side of the Christiania Fiord. Pop. 40,000. C. is the seat of the Norwegian government, the superior courts, and the *Storthing*. Besides the suburbs of Pipervigen, Hammarsborg, Vaterland, and Groenland, the town consists of C. properly so called (which was laid out by Christian IV. in 1614, in the form of a regular parallelogram of 1000 paces in length and breadth); the Old Town or Opslo, where the bishop resides; and the citadel Aggerhuus, from which the broad straight streets of the town can be fired upon. The most important public buildings are the royal palace, the bank and exchange, the house of representatives or Storthing, the governor's palace, and the cathedral. To these may be added the university, the only one in Norway, which was opened in 1813, and possesses a staff of 21 ordinary, and 9 extraordinary professors. About 650 students attend it annually. This institution contains, besides various scientific collections, a library of about 125,000 books, a botanical garden, and an observatory (in 59° 54′ 42″ N. lat., and 10° 50′ E. long.). The latter was opened in 1833. C. has also some good schools and learned societies, of which the 'Society for Northern Antiquities' is famous. The manufactures of C. are cotton, oil, paper, soap, and bricks. There are also numerous distilleries and corn-mills. It exports in considerable quantities wood, iron, anchovies, and glass-wares. From 600 to 700 ships yearly enter the port (which, however, is covered with ice for four months), and it has a regular steam-boat communication with Gottenburg, Copenhagen, Kiel, and Hull. C., by means of its bay, is connected with Drammen (pop. 10,000), famous for its extensive trade in timber, &c. The scenery of the whole bay is unsurpassed in beauty.

**CHRISTIA'NITY.** It is proposed in the present article to give a very brief outline of the system of the Christian religion, and of the evidences by which its truth is established. The principal parts, both of the system and evidences of C., will be found noticed under separate heads.

C. comes to us with a claim to be received as of divine origin. It is no product of the human mind, but has for its author the Being whom it sets before us as the object of worship. It is consequently altogether exclusive; it claims to be deemed the only true religion—'the truth'—and admits of no compromise or alliance with any other system.

C. cannot be viewed as distinct from the religion of the Jews and of the patriarchs; it is the same religion accommodated to new circumstances; there has been a change of *dispensation* only. In studying either the system or the evidences of C., we are compelled continually to revert from the New Testament to the Old, and must in some measure trace the history of the true or revealed religion through the previous and preparatory dispensations.

The whole system of C. may be regarded as having its foundation in the doctrine of the Existence of one God. See GOD, EXISTENCE AND ATTRIBUTES OF. Next to this may be placed the doctrine of the Fall (q. v.) of Man. Man is represented as involved in misery by sin (q. v.)—*original* and *actual*—and every individual of the human race as incapacitated for the service and fellowship of God, obnoxious to the displeasure of God, and liable to punishment in a future and eternal state of being. See PUNISHMENT, FUTURE. And here we may regard the doctrine of the ATONEMENT (q. v.) as next claiming our attention—a doctrine taught in all the sacrifices (see SACRIFICE) of the patriarchal and Jewish dispensations, as well as by the words of inspired teachers. Man being utterly incapable of effecting his own deliverance from sin and misery, God sent his Son to save sinners, to deliver them from hell, to make them holy, and partakers of the eternal joy and glory of heaven.

By those who regard Christ as a mere creature, *atonement* or *reconciliation* with God is made to depend on the repentance of man as its immediate cause; whilst the life and death of Christ are represented as merely an example to us of obedience, virtue, and piety in the most trying circumstances; the doctrines of a propitiatory sacrifice, a substitutionary obedience, and an imputed righteousness, with all that form part of the same system, falling completely and even necessarily to the ground. These doctrines, however, are all consistently maintained in connection with the doctrine of the Trinity and the generally received doctrine as to the person of Christ. See CHRIST and TRINITY. The very incarnation (q. v.) of the Son of God is regarded as a glorious display of the divine condescension, and a wonderful exaltation of human nature: whilst a personal enjoyment of the highest dignity and bliss of which humanity is capable in the favour and fellowship of God for ever, is to be attained by faith in Jesus Christ. See FAITH and JUSTIFICATION.

The indissoluble connection between faith and salvation arises from the divine appointment, but secures a moral harmony, as it provides for bringing into operation—in accordance with the intellectual and moral nature of man—of most powerful and excellent motives for all that is morally good, the partakers of salvation being thus fitted for the fellowship of Him into whose favour they are received; and as it prevents the possibility of any of them taking to themselves, or giving to others, the glory of that salvation which they really owe to Christ, and which they must therefore ascribe to Christ, as God is a God of truth, and truth must reign in the kingdom of heaven.

Salvation is ascribed by all Christians to the grace of God. The mission of Christ was an act of supreme grace; and all must be ascribed to grace for which we are indebted to Christ. The doctrine of grace, however, is a part of the system of C. on which important differences subsist, especially as to the relation of the grace of God to individual men. Such are the differences concerning ELECTION (q. v.), and concerning the origin of faith, and man's ability or inability to believe of himself. But by Christians generally, the personal relation of the believer to Christ, and his faith in Christ, are ascribed to the Holy Ghost or Spirit of God, the third person of the Godhead, and so to the grace of God. See ARMINIUS, CALVINISM, and PELAGIUS.

In the view of all who hold the doctrine of the Trinity, the doctrines concerning the Spirit of God form a very important part of the Christian system. To the agency of this person of the Godhead, besides all that is ascribed to Him concerning the human nature of Christ, we are indebted for all that is spiritually good in man; He, in the economy of grace, being sent by God, on the intercession of Christ, to communicate the blessings purchased by Christ in his obedience and death. See HOLY GHOST.

Salvation begins on earth; and whenever a man believes in Christ, he is a partaker of it—is in a state of salvation. It forms an essential part of the Calvinistic system, that he who is in a state of salvation always remains so, and that the salvation begun on earth is in every case made perfect in heaven. See PERSEVERANCE OF THE SAINTS. Thus salvation is viewed as beginning in REGENERATION (q. v.), and as carried on in SANCTIFICATION (q. v.), and all its joys as connected with the progress of sanctification. Faith in Jesus Christ cannot be unaccompanied with repentance, and repentance is always renewed when the exercise of faith is renewed. For although all believers are *saints* or *holy*, as set apart to God, and in contrast to what they previously were, yet there is none in this life free from temptation and sin; the successful tempter of our first parents, who assailed our Saviour with temptation and was defeated, being still the active enemy of men, against whom believers in Jesus Christ are called to contend, to watch, and to pray. See DEVIL. The sense of responsibility belongs to human nature; and the doctrine of a Judgment (q. v.) to come may be considered as to a certain extent a doctrine of natural religion, as may also that of the Immortality (q. v.) of the Soul; but the clear and distinct enunciation of these doctrines belongs to the Christian revelation, to which belongs entirely the doctrine of the Resurrection (q. v.) of the Dead.

Of the moral part of C., which has already been referred to, it may be sufficient here to state, that it is as harmonious with the doctrinal as it is inseparable from it; that it is founded upon the attributes of God, and is perfectly illustrated in the character of Jesus Christ; and that it is divisible into two great parts—one, of the *love of God*, and the other, of the *love of man*, or of ourselves and our neighbours. See LAW, MORAL.

The *means of grace*, or of the attainment of the blessings of salvation, form an important part of the Christian system. Of these the WORD OF GOD—or divine revelation contained in the Bible (q. v.)—first claims attention, as the means of *conversion* to Christ, and of *edification* in Christ, the instrument by which salvation is both begun and carried on in men. The ordinances of God's worship are among the means of grace. Thus Prayer (q. v.) is one of the chief means of grace. The Sacraments (q. v.) are means of grace, concerning the precise use of which, and their relative importance as compared with the other means, considerable difference of opinion prevails among Christians. The same remark applies also to the combination of Christians into an organised body or community, the Church (q. v.), with its own laws or system of church-government (q. v.) and church-discipline (q. v.).

We have endeavoured to sketch the outline of the system of C., as much as possible according to the general belief of Christians, merely indicating the points on which the chief differences of opinion exist. Some of the principal controversies will be found noticed under separate heads.

The truth of C. is established by many different *Evidences*, distinct and independent, but mutually corroborative. It appeals to reason, and demands to have its claims examined and admitted. Nor is there any *faith* where there is not a mental conviction arrived at by a process of sound reasoning.

The evidences of C. are very generally divided into two great classes, *internal* and *external*—the former consisting of those which are found in the nature of the Christian system itself, and in its adaptation to the nature and wants of man; the latter, of those which are derived from other sources. The boundary between the two classes, however, is by no means so distinct in reality as it appears in the definition of the terms. Of the multitude of books which have been written on the subject of the evidences of C., some are devoted mainly to one of these classes, and some to the other; whilst some are occupied with the development of particular evidences or arguments, and some with the refutation of objections, and in particular of what may be called a preliminary objection—that a divine revelation can never be established by sufficient evidence at all. See REVELATION.

The evidence of Miracles (q. v.) and the evidence of Prophecy (q. v.), two of the principal branches of the external evidences of C., will be found noticed in separate articles. Another argument, which has been much elaborated—for example, in Paley's *Evidences*—is derived from the character and sufferings of the apostles and other first preachers of C.; their high moral worth, considered along with their great earnestness and devotedness; the absence of all possibility of selfish or base motives; and at the same time, their perfect opportunity of knowing the truth of the facts which they proclaimed. A subsidiary argument is found in the admission of the great facts regarding Jesus of Nazareth, by the early opponents of Christianity. A most important and valuable argument is found in the perfect coherence of all the parts of the Christian system, and in the agreement, as to the religion which they teach, of all the books of Scripture, notwithstanding the widely different dates of their composition, and their very different nature in other respects. See BIBLE. The relation of the Jewish ceremonies to the doctrines of C. supplies another argument of this kind, capable of being developed in a multitude of particulars. The minor coincidences between the different books of Scripture have been pointed out with happy effect in the *Horæ Paulinæ* of Paley, and in other works. The character of our Saviour supplies an argument of great power: the impossibility of the invention of such a character, and of the history in which it is exhibited, by any effort of human genius, is also urged as corroborative; and the inconsistency of the morality displayed, with the supposition of imposture, has been dwelt upon with the same view. The excellency, both of the doctrinal and moral part of the system of C., its elevating and purifying tendency, the agreement of its doctrine with the facts of man's sinfulness and misery, and the suitable provision which it makes for his most deeply felt wants, are principal branches of the internal evidence of its truth. The effects of C., where it has prevailed, supply a confirmatory argument in its favour, which has formed the subject of works of great learning and interest.

**CHRI'STIANSAND**, the principal town of the province or *stift* of that name in Norway, is situated at the mouth of the Torridalself, in the bay of Christiansand. Pop. about 12,000. C. is the residence of a bishop and high-bailiff or stift-amtmand, and possesses a branch of the Norwegian Bank, a gymnasium, and several charitable foundations. The manufactures are leather, tobacco, cotton, &c. Shipbuilding forms also a considerable branch of its industry. The town, which was built in 1641 by Christian IV., has an excellent harbour, divided into two parts by the island of Oddern, upon which are situated the quarantine hospital and custom-house. C. exports wood, lobsters, and salmon in large quantities. The town and harbour are protected by several fortifications. To the west of C. lies the harbour of Ny-Hollesund.

**CHRI'STIANSFELD**, a settlement of Moravian brothers, in the northern part of Schleswig, was founded in 1772. It consists of 64 houses and about 700 inhabitants. The houses, which are well built, and cheerful in appearance, are arranged in two parallel streets, with the church upon a green plot in the middle. The settlement is represented by the inspectors or chiefs appointed by the directors of the fraternity, and the representatives elected by the members of the sect. The manufactures are linen, soap, cotton, leather, &c.

**CHRI'STIANSTAD**, the strongly fortified capital of a province of the same name in the south of Sweden. It is situated on the Helge, about 9 miles from the Baltic, and 265 south-west of Stockholm. C. is the residence of a governor, and the seat of a court of justice. It is a beautifully built town, and possesses an arsenal, a school, a magnificent church, and a senate-house. Pop. 5000, employed chiefly in the manufacture of woollen goods, leather, gloves, &c. There is also some trade in wood, pitch, potash, &c. The town, which was founded by Christian IV., has suffered many sieges during the wars between Denmark and Sweden. The province of Christianstad has an area of 2400 miles, and 196,000 inhabitants.

**CHRI'STIANSTED**, the chief town of the Danish island of St Croix, in the West Indies. It stands on the north-east coast of the island, and has an excellent harbour, which is defended by a fort and a battery. Here resides the governor-general of the Danish West Indies. In 1855, the population was 9521, of whom 1250 were slaves.

**CHRISTI'NA**, queen of Sweden, only child of the great Gustavus Adolphus, was born December 1626, and succeeded her father in 1632, when only six years old. Distinguished equally by beauty and the possession of a lively imagination, a good memory, and uncommon intelligence, she received the education rather of a man than of a woman; and to this may in part be attributed the many eccentricities of her life. During her minority, the kingdom was governed by the five highest officers of the state, the principal being Chancellor Oxenstiern. In 1644, she assumed the reins of power, and, in 1650, was crowned with the title of *king*. She had previously declared her cousin, Charles Gustavus, her successor. For four years thereafter, she ruled the kingdom with vigour, and was remarkable for her patronage of learned and scientific men. In 1654, however, at the age of 28, weary of the personal restraint which royalty imposed on her, she abdicated in favour of her cousin, reserving to herself sufficient revenues, entire independence, and supreme authority over her suite and household. Leaving Sweden, she proceeded to Brussels, where she embraced the Roman Catholic religion. She afterwards went to Rome, which she entered on horseback, in the costume of an Amazon, with great pomp. Confirmed by Pope Alexander VII., she adopted the surname of Alessandra. In 1656, she visited Paris; and the following year, on a second residence there, she caused her grand equerry, Monaldeschi, who had enjoyed her entire confidence, to be executed in her own household for treason. In 1658 she returned to Rome, and, in 1660, the death of the king, her cousin, caused her to hasten to Sweden; but, failing in her attempt to be re-instated on the throne, she again left the country. In 1666, she aspired to the crown of Poland, but was unnoticed by the Poles. The remainder of her life was spent at Rome in artistic and scientific pursuits. Besides founding an academy, she collected valuable MSS., medals, and paintings, and died April 19, 1689. Much of her conduct favours the idea that at times she was scarcely sane.

**CHRISTINA**, queen of Spain. See MARIA CHRISTINA.

**CHRI'STISON**, ROBERT, an eminent Scottish physician, son of Alexander Christison, Professor of Humanity in the university of Edinburgh, was born at Edinburgh, July 18, 1797; was educated at the High School of his native place, and, in 1811, became a student at the university there. After graduating in 1819, he proceeded to London and Paris; and, in the French capital, studied toxicology under the celebrated Orfila, a department of medical science in which in Britain his name has become eminent. Commencing the practice of medicine at Edinburgh, he was, in 1822, appointed Professor of Medical Jurisprudence in the university of that city, and, in 1832, was promoted to the chair of Materia Medica. Besides contributing papers on various subjects to medical journals, C. is author of a *Treatise on Poisons*, published in 1829, recognised as a standard work on the subject; *Biographical Sketch of Edward Turner, M.D.*, 1837, being an address delivered before the Harveian Society of Edinburgh; a treatise *On Granular Degeneration of the Kidneys*, 1839; and *The Dispensatory, a Commentary on the Pharmacopœias of Great Britain*, 1842. Twice President of the Royal College of Physicians, Edinburgh, and Ordinary Physician to the Queen in Scotland, in 1859 he was appointed by the Chancellor of the university of Edinburgh one of the assessors of the University Court.

**CHRI'STMAS**, the day on which the nativity of the Saviour is observed. The institution of this festival is attributed by the spurious Decretals to Telesphorus, who flourished in the reign of Antoninus Pius (138—161 A. D.), but the first certain traces of it are found about the time of the Emperor Commodus (180—192 A. D.). In the reign of Diocletian (284—305 A. D.), while that ruler was keeping court at Nicomedia, he learned that a multitude of Christians were assembled in the city to celebrate the birthday of Jesus, and having ordered the church-doors to be closed, he set fire to the building, and all the worshippers perished in the flames. It does not appear, however, that there was any uniformity in the period of observing the nativity among the early churches; some held the festival in the month of May or April, others in January. It is, nevertheless, almost certain that the 25th of December *cannot* be the nativity of the Saviour, for it is then the height of the rainy season in Judea, and shepherds could hardly be watching their flocks by night in the plains.

C. not only became the parent of many later festivals, such as those of the Virgin, but especially from the 5th to the 8th c., gathered round it, as it were, several other festivals, partly old and partly new, so that what may be termed a *Christmas Cycle* sprang up, which surpassed all other groups of Christian holidays in the manifold richness of its festal usages, and furthered, more than any other, the completion of the orderly and systematic distribution of church festivals over the whole year. Not casually or arbitrarily was the festival of the Nativity celebrated on the 25th of December. Among the causes that co-operated in fixing this period as the proper one, perhaps the most powerful was, that almost all the heathen nations regarded the winter-solstice as a most important point of the year, as the beginning of the renewed life and activity of the powers of nature, and of the gods, who were originally merely the symbolical personifications of these. In more northerly countries, this fact must have made itself peculiarly palpable—hence the Celts and Germans, from the oldest times, celebrated the season with the greatest festivities. At the winter-solstice, the Germans held their great Yule-feast (see YULE), in commemoration of the return of the fiery sun-wheel; and believed that, during the twelve nights reaching from the 25th December to the 6th January, they could trace the personal movements and interferences on earth of their great deities, Odin, Berchta, &c. Many of the beliefs and usages of the old Germans, and also of the Romans, relating to this matter, passed over from heathenism to Christianity, and have partly survived to the present day. But the church also sought to combat and banish—and it was to a large extent successful—the deep-rooted heathen feeling, by adding—for the purification of the heathen customs and feasts which it retained—its grandly devised liturgy, besides dramatic representations of the birth of Christ and the first events of his life. Hence sprang the so-called 'Manger-songs,' and a multitude of C. carols, as well as C. dramas, which, at certain times and places, degenerated into farces or fools' festivals (q. v.). Hence also originated, at a later period, the Christ-trees, or C.-trees, adorned with lights and gifts, the custom of reciprocal presents, and of special C. meats and dishes, such as C. rolls, cakes, currant-loaves, dumplings, &c. Thus, C. became a universal social festival for young and old, high and low, as no other Christian festival could have become.

In the Roman Catholic Church, three masses are performed at C.—one at midnight, one at daybreak, and one in the morning. The day is also celebrated by the Anglo-Catholic Church—special psalms are sung, a special preface is made in the Communion Service, and the Athanasian Creed is said or sung. The Lutheran Church, on the continent, likewise observes C.; but the Presbyterian churches in Scotland, and the whole of the English dissenters, reject it, in its religious aspect, as a 'human invention,' and as 'savouring of papistical will-worship,' although, in England, dissenters as well as churchmen keep it as a social holiday, on which there is a complete cessation from all business. But within the last hundred years, the festivities once appropriate to C. have much fallen off. These at one time lasted with more or less brilliancy till Candlemas, and with great spirit till Twelfth-day; but now a meeting in the evening, composed, when possible, of the various branches and members of a family, is all that distinguishes the day above others.

**CHRISTMAS BOX**, a small money-gift to persons in an inferior condition on the day after Christmas, which is hence popularly called *Boxing-day*. The term, and also the custom, are essentially English, though the making of presents at this season and at the new year is of great antiquity. A number of interesting particulars concerning the C. B. will be found in Brand's *Popular Antiquities*. Here, we need refer only to the usage in its later aspect. Within the memory of middle-aged persons, the practice of giving Christmas boxes, or petty presents, to apprentices, domestic servants, and tradesmen, had become a serious social nuisance, more particularly in London, where every old custom seems to linger, and is most difficult to be got rid of. Householders felt under an obligation to give money to the apprentices in the shops where they dealt, also to various inferior parish officers, including scavengers and lamplighters; while shopkeepers, on the other hand, were equally impelled to make presents to the male and female servants of their customers. Thus, as referred to in *Christmas*, a poem:

> 'Gladly, the boy, with Christmas Box in hand,
> Throughout the town his devious route pursues;
> And, of his master's customers, implores
> The yearly mite: often his cash he shakes;
> The which, perchance, of coppers few consists,
> Whose dulcet jingle fills his little soul
> With joy.'

At length the C. B. system became such an intolerable grievance, that tradesmen stuck up notices in their windows that no Christmas boxes would be given; and at the same time, the public authorities issued remonstrances to the same effect. At Christmas 1836, the Secretary of State for Foreign Affairs issued a circular to the different embassies, requesting a discontinuance of the customary gifts to the messengers of the Foreign department, and other government servants. Since this period, the practice has greatly decreased, doubtless to the improvement of the self-respect of the parties interested.

**CHRISTMAS CAROLS.** The word carol (Ital. *carola*, and Fr. *carole*, a round dance—probably from Lat. *corolla;* Welsh, *coroli*, to reel, to dance; the name is thence applied to the music or song accompanying such a dance: *carillon* is probably allied) signifies a song of joy. The practice of singing carols, or, at all events, sacred music, in celebration of the nativity of Christ as early as the 2d c., is considered as proved by the circumstance that a large sarcophagus belonging to that period has sculptured upon it a representation of a Christian family joining in choral praise for this purpose. A century or two after this, however, the C. C. seem to have sadly degenerated, and become, in fact, so indecent, that the clergy found it necessary to forbid them. Under the Anglo-Saxon kings, merriment and piety were pleasantly combined in English life, a peculiarity that affected the C. C. of that period not a little; but by the 13th c. the jocosity had unhappily lapsed into what would now be considered profanity. The oldest printed collection of English C. C. bears the date of 1521. The majority of these, though written by men of learning—priests and teachers—exhibit a lamentable ignorance of the character of the two most prominent persons in the carols—Mary and Jesus. In 1525 was kept the 'still Christmas,' on account of the illness of King Henry; but with this exception, the sacred season appears to have been regularly celebrated with joyous music and songs during the Tudor period. In 1562, C. C. of a more solemn nature were introduced. By the Puritan parliament, Christmas was abolished altogether, and holly and ivy were made seditious badges; and in 1630 the Psalms, arranged as carols, were advertised. After the Restoration, the C. C. again exhibited a hearty, cheerful, and even a jovial character. Those with which the dawn of Christmas is now announced in England are generally religious, though not universally so. In France, the carols at this season used to be much less sacred than gay. Often, indeed, they were grossly Bacchanalian.

See an interesting paper in the *Athenæum* for December 20, 1856; also Sandys's *Christmas Carols*, 8vo, 1833.

**CHRISTMAS ROSE.** See HELLEBORE.

**CHRISTO'LOGY** is the doctrine of the Person of Christ. The word itself is to be found, once or so, in the divines of the 17th c. (see Dean Trench on the *Study of Words*), but the department of scientific theology which it now represents is almost entirely the growth of modern, and particularly of German inquiry. As yet, it can hardly be said that the word C. is accredited in Great Britain, but the same differences of opinion which led to its adoption in Germany, are beginning to manifest themselves here also. There are only three methods of apprehending the doctrine of the Person of Christ. First, there is the *Rationalistic* method. This consists in representing the development of the Messianic idea in Jewish history as purely natural, and conditioned by purely human and historical influences—in short, as a subjective or self-originated notion, to which there was no correspondent Divine Reality. Second, there is, what, for want of a better word, we may call the *Spiritualistic* method (that of theologians like Neander, Rothe, &c.). This consists in representing the development of the Messianic idea in Jewish history as both natural and supernatural; that is to say, it asserts the existence of a Divine Objective Reality ('the Eternal Son of God') as the basis of the subjective idea in the minds of the Jews, and regards the growth of that idea, and the influence of historical circumstances, as the result of a supernatural Providence, which culminated in the revelation 'of the mystery of godliness, God manifest in the flesh.' Third, there is the *Dogmatic* method, which is the one accepted by the common order of theologians. This consists in representing the doctrine of the Person of Christ as *symbolically* known to the spiritually-minded among God's people from the earliest ages. 'Abraham saw his (Christ's) day afar off.' This is interpreted to signify that, by the grace of prophetic illumination, the righteous men of old were enabled to foresee in a mysterious and inexplicable manner the atonement of Christ, as it happened in history. Admitting with the Spiritualistic theologians, that the Messianic idea among the Jews underwent, in some sense, a historical development, the dogmatic Christologists differ, in general, from the former by attributing to the higher minds such a knowledge of the *work* of Christ, as logically involves a knowledge of his person and character. The entire absence, however, of any *personal* traits of Christ in the Old Testament, such as might be expected of those who had seen him even with the eye of faith, has induced many orthodox theologians to shrink from making any statement in regard to what may have been the doctrine of the Person of Christ among the ancient Jews.

**CHRISTOPHE, HENRI**, king of Hayti, born October 6, 1767, was at one period a slave and tavern-cook in Cape Town, St Domingo, and afterwards overseer of a plantation. In 1790, he joined the black insurgents against the French, and, from his gigantic stature, energy, and courage, soon became a leader among them. By Toussaint Louverture, he was appointed brigadier-general, and employed to suppress an insurrection headed by Moyse, or Moses, his nephew. C. captured the latter, and on his execution, succeeded him as governor of the northern province of French St Domingo. In 1802, he gallantly defended Cape Town when General Leclerc arrived there with a French army destined for the reduction of the blacks, and effected his retreat with 3000 men, after having burned the greater part of the town. The perfidious seizure of Toussaint, he amply revenged, and during the short-lived government of Dessalines, who was slain by a military conspiracy in October 1806, C. was general-in-chief of the Haytian army. In February 1807, he was appointed President of Hayti for life. A republic being, about the same time, organised at Port-au-Prince, with Petion at its head, civil war commenced between them. On March 28, 1811, C. was proclaimed *king* of Hayti, by the name of Henri I., and solemnly crowned, June 2, 1812. In 1814, he and Petion suspended hostilities, and by his power and skill, C. was enabled to counteract the attempts made by France to regain its authority in the island. His avarice and cruelty led to an insurrection, which was aided by General Boyer, who had succeeded Petion in 1818; and the rebellion having spread to Cape Town, C.'s deposition was proclaimed, at the head of the troops, by the Duke of Marmalade, one of the first dignitaries in the kingdom. Deserted by his body-guard and all his nobles, he shot himself, October 8, 1820. He left a code of laws, which he called the 'Code Henri,' in imitation of the Code Napoleon.

**CHRI'STOPHER, HERB.** See ACTÆA.

**CHRISTOPHER, ST**, a saint of the Roman Catholic and Greek churches. He is supposed to have suffered martyrdom about the middle of the 3d century. According to vulgar legend, C., whose name was originally *Adokimos* (the Unrighteous), was a native of Palestine, Syria, or Lycia, and a person of prodigious bulk and strength. His height was 12 feet. So proud was he of his gigantic frame, that he would serve only the mightiest princes. Having attached himself to one, who went for the greatest of his day, C. stayed with him for a short time, but soon discovered that his master was terribly afraid of the devil, in consequence of which, C., with fearless consistency, passed into the service of the latter. One day, however, when the devil and he chanced to be walking through a wood, they came across an image of Christ. His new master exhibited such perturbation and alarm at the sight, that C. entirely lost confidence in him, and resolved to find out the Saviour, and follow him. For a long while he searched in vain, but finally he fell in with a hermit, who shewed him Christ, and baptized him. C. despised the customary penances, and in consequence, it was imposed on him to carry Christian pilgrims on his shoulders over a stream which had no bridge. One day, a little child came to the stream; C. took it on his shoulders, but soon began to sink under the weight of his burden. The child was Christ himself, and to prove it, he commanded

C. to stick his staff into the ground. He did so, and next morning it had blossomed into a palm-tree bearing fruit. This miracle converted thousands to Christianity. C.'s success excited the enmity of Dagnus, the prefect of that region, who put him in prison, scourged him with red-hot rods, put a burning helmet on his head, and clapped him on a burning stool. C. still remained uninjured. Multitudes of poisoned arrows were now discharged against him, but they rebounded from his charmed body, and one even wounded the prefect himself in the eye. C. pitied his tormentor, and freely offered his head to the executioner, that the prefect might be healed by the blood which should flow from it. This was done, and, as a matter of course, Dagnus and his family became Christians. The Greek Church celebrates his festival on the 9th of May; the Roman Catholic, on the 25th of July.

St C. was greatly invoked in times of pestilence, or when people were digging for treasures, to frighten away the spirits who watched over them. The formula used was called a *Christopher's Prayer.* He was also the patron of an Order of Moderation, founded in Austria in 1517, for the purpose of checking excessive drinking and swearing, and which was called the Order of St Christopher.

**CHRISTOPHER'S**, St, or, popularly, *St Kitts*, an island near the north-east bend of the great arch of the Antilles, 46 miles to the west of Antigua, and 2 miles to the north of Nevis. With a very unequal breadth, it is 20 miles long from south-east to north-west, containing about 44,000 acres, and about 25,000 inhabitants. It belongs to Great Britain, and has a legislature of its own, with an executive immediately subordinate to the governor-in-chief of the Leeward group, residing in Antigua. In 1857, the revenue of the colony was £19,399, having been only £3638 in 1834; so that, under the system of free labour, it had increased more than fivefold in 23 years. During the same interval, the imports had risen in value from £63,018 to £144,582, and the exports from £105,267 to £208,188. The staple exports are sugar, rum, and molasses. The prosperity of the island seems to be constantly progressive down to the latest dates. Education is in a promising condition. In 1858, 34 schools—averaging 1 school to 2 square miles—were attended by 1459 pupils—17 of the establishments belonging to the Church of England, 9 to the Moravians, and 8 to the Wesleyans.

The chief towns, both of them seaports with open roadsteads, are Basseterre, defended by Fort Smith, and Sandy Point, protected by Fort Charles and Brimstone Hill. Of Fort Smith, the exact lat. and long. are 17° 17′ 7″ N., and 60° 42′ 2″ W. The mean annual temperature of these places, and of the coast generally, is about 80° F.; but the mornings and evenings, even of the hottest days, are agreeably cool. The length of the island is traversed by a well-wooded ridge of volcanic origin, which has in its centre a crater; and towards the west extremity of the range, rises the nearly perpendicular crag of Mount Misery, with an altitude of 3711 feet above the level of the sea. Over the adjacent slopes, which gradually descend to the water's edge, this central range sends down several streams—almost every plantation, in fact, receiving its rivulet in the rainy season. The springs, though numerous, are yet mostly brackish; and indeed the southern extremity of the island presents a number of salt ponds.

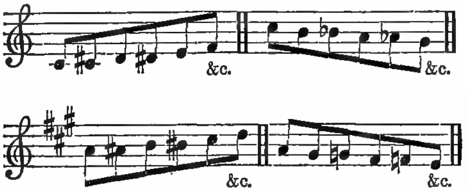
St Kitts, appropriately named by the natives 'The Fertile Isle,' was discovered by Columbus in 1493, and colonised by the English in 1623, who were almost immediately joined by some French adventurers. After treacherously and cruelly exterminating the Caribs, the French and English, often quarrelling with each other, cultivated different portions of the island, till, in 1713, the Treaty of Utrecht gave the whole to England. In 1782, during the war of American Independence, St Kitts was captured by the French, but permanently restored in the following year.

**CHRIST'S COLLEGE**, Cambridge, was originally founded by Henry VI., under the name of God's House, and was intended by him to consist of a master, 12 fellows, and 47 scholars. In 1505, however, there were only three fellows besides the master, when Lady Margaret, Countess of Richmond and Derby, mother of Henry VII., 'counting herself, as of the Lancaster line, heir to all Henry VI.'s godly intentions,' made up the full number, and endowed the college liberally, changing its name to Christ's College. Edward VI. added one fellow, and three scholars; and Sir John Finch and Sir Thomas Baines increased the number to fifteen. This college has also received many rich benefactions for the encouragement of students, amongst which are specially to be noticed four studentships founded by Christopher Tancred, worth £107 per annum, and tenable for three years after taking the degree of B.A. A student is elected annually before coming into residence. Amongst the illustrious men connected with this college may be noted Bishop Latimer, John Milton, and Ralph Cudworth, author of the *Intellectual System.*

**CHRIST'S HOSPITAL**, Newgate Street, London, was founded on the site of the Greyfriars' Monastery, by Edward VI., June 26, 1553, as a hospital for orphans and foundlings. It is usually called the 'Blue Coat School,' on account of the dress worn by the boys. This consists of a blue woollen gown or coat with a narrow red-leather girdle round the waist, yellow breeches, and yellow stockings, a clergyman's bands at the neck, and a small blue worsted cap, but this last they seldom wear, and are generally seen going about bareheaded—such has been the costume of the boys since the foundation of the school in the reign of Edward VI.; the persistency in it through successive generations, affording a curious instance of the unchangeableness in some of the English usages. No boy is admitted before seven years of age, or after ten, and none can remain after fifteen, with the exception of 'King's boys' (i. e., those who attend the mathematical school founded by Charles II. in 1672) and 'Grecians' (i. e., the highest class of scholars in the hospital), of whom 8 are sent on various scholarships to the universities of Oxford and Cambridge. Altogether, about 800 boys can be admitted. The right of presentation is vested in the managing governors. These are the lord mayor of London, the aldermen, and 12 common councilmen. Besides these, all noblemen and gentlemen who benefit the hospital to the extent of £400 are governors. The managing governors are the patrons of several churches, chiefly in Surrey and Essex. The most of the income of C. H., which amounts to about £50,000, is derived from legacies subsequent to its original charter. King Charles's Foundation enriched it by £7000, with an additional annuity of £370, 10*s*., for the purpose of educating yearly ten boys for the sea-service. Most of the building perished in the Great Fire of 1666; but, through the generosity of the corporation of London, and the liberal help of wealthy Englishmen, it was soon rebuilt, under the superintendence of Sir Christopher Wren. In the course of time, the new hospital fell into decay, and in 1825, a third structure was erected by Mr Shaw. The great hall of the hospital is a magnificent room, second only to that of Westminster. C. H. is essentially a classical institution, Latin and Greek being the basis of education; but, to satisfy the wants arising from the changed condition of society, the modern languages, drawing, &c., are also taught. In 1683, the governors built a preparatory school at Hertford, where the hospital children are nursed and instructed till they are old enough to enter the hospital. The *girls*, however, remain permanently here. It can receive about 400 of both sexes. Several eminent persons have been educated at C. H., such as Camden, Stillingfleet, Coleridge, and Lamb.

**CHRIST'S THORN.** See Jujube and Paliurus.

**CHROMA'TIC,** in Music, is a term applied to a series of notes at the distance of a semitone from each other. Such a series is produced by dividing the whole tones of the diatonic scale into semitones, so that with the two diatonic semitones, already in the natural scale, the octave is divided into twelve semitones. The word C. is from the Greek, and means coloured. Ascending C. passages are formed by the whole tones of the diatonic scale being raised or elevated by a sharp or a natural, according to key, and descending passages by their being lowered by a flat or a natural, thus:



It is usual to speak of the C. scale, but that is wrong, as it is only a melodious progression of semitones, certain notes of which belong to, and form the diatonic scale, shewing that the foundation of the system of music does not rest on a C. basis, but on the natural diatonic progression of sounds.

**CHROMATIC,** in Optics. See Achromatic.

**CHROMA'TICS** is that part of the science of Optics (q. v.) which explains the properties of the colours of light and of natural bodies. Before 1666, when Sir Isaac Newton began to investigate this subject, the notions which prevailed respecting the nature of colours were purely fanciful. Till Descartes' time, indeed, it seems not to have been conceived that colour had anything to do with light. As examples of the notions prevalent at very early times, we may cite those propounded by Pythagoras and Zeno. According to the former, colour was the superficies of bodies; according to the latter, it was 'the first configuration of matter'—whatever that may be. It is now settled that white light is not homogeneous, but consists of rays of different colours, endued with different degrees of refrangibility, and that the different colours of bodies arise from their reflecting this or that kind of rays most copiously. According to this, a body that appears red reflects red rays in greater abundance than the others; and one that appears black reflects none of the rays—in other words, absorbs all the light that falls upon it. The analysis of a beam of the sun's light by a prism was the experiment by which Newton demonstrated his great optical discovery of the unequal refrangibility of the variously coloured rays, and laid the foundations for the above theory of colour. The reader will find an account of this experiment under the article Spectrum; and under Fraunhofer's Lines he will find an account of the most interesting phenomena presented by the spectrum. Newton concluded from his experiments that white light is composed of seven colours, which he called the primary colours—viz., red, orange, yellow, green, blue, indigo, and violet, and that all other shades of colour arise from the admixture of these in different proportions. Sir David Brewster, on the other hand, conceives that he has established that the primary colours are only three in number—red, yellow, and blue. This result he obtained by examining the rays of the spectrum through different absorbing media—a mode of experiment now admitted to be fallacious in principle. Professor Maxwell, by direct examination of the rays, concludes that the three primary colours are red, green, and blue. Recently, a theory has been propounded, that all the colours are the results of the admixture of white light and of shade, or darkness; but as yet no attempt has been made to support this theory by direct experiment on the sun's rays. It is rested on results obtained by combining by motion certain proportions of white and black pigments on a revolving card. See articles Light, Dispersion of Light, and Newton's Rings.

**CHRO'MATYPE** (Gr. *chrome*, colour; *typos*, impression), a photographic process, thus described by its discoverer, Mr R. Hunt. One drachm of sulphate of copper is dissolved in one ounce of distilled water, to which is added half an ounce of a saturated solution of bichromate of potash; this solution is applied to the surface of the paper, and when dry, it is fit for use, and may be kept for any length of time without spoiling. When exposed to sunshine, the first change is to a dull brown, and if checked in this stage of the process, we get a negative picture; but if the action of light is continued, the browning gives way, and a positive yellow picture on a white-ground is obtained. In either case, if the paper, when removed from sunshine, is washed over with a solution of nitrate of silver, a very beautiful positive picture results. In practice, it will be found advantageous to allow the bleaching action to go on to some extent; the picture resulting from this will be clearer and more defined than that obtained when the action is checked at the brown stage. To fix these pictures, it is necessary to remove the nitrate of silver, which is done by washing them in pure water. If the water contains any chlorides, the picture suffers, and long soaking in such water obliterates it—or if a few grains of common salt be added, the apparent destruction is rapid. The picture is, however, capable of restoration, all that is necessary being, to expose it to sunshine for a quarter of an hour, when it revives; but instead of being of a red colour, it assumes a lilac tint, the shades of colour depending upon the quantity of salt used to decompose the chromate of silver which forms the shadow parts of the picture. Mr Bingham has suggested the substitution of sulphate of nickel for sulphate of copper, as yielding a higher degree of sensitiveness and greater definition, on development with nitrate of silver.

**CHRO'MIUM** (*chrome*, colour) is a metal, so called from the many coloured compounds it produces. It was discovered by Vauquelin in 1797. C. occurs naturally as the chromate of lead ($PbO,CrO_3$), and the chromite of iron, *chrome iron ore* ($FeO,Cr_2O_3$), at Unst and Fetlar in the Shetlands, and Portsoy in Banffshire, &c. The metal has been obtained in powder and in scales, but as a metal it possesses no interest. The principal compound of C. is the bichromate of potash, obtained by heating chrome iron ore in powder with one-fourth of its weight of nitre, and then digesting in water, which dissolves out the chromate of potash ($KO,CrO_3$), a yellow salt, and when this is acted upon by sulphuric acid, it is converted into bichromate of potash ($KO,2CrO_3$), readily crystallises in orange-red crystals, which is soluble in water, and is largely used by the dyer and calico-printer. If this salt be added to a solution of lead, an abundant yellow precipitate occurs of chromate of lead ($PbO,CrO_3$), or *chrome yellow*, which is used largely by the painter as a yellow pigment. A sesquioxide of C. ($Cr_2O_3$), *chrome green*, possessing a bright green colour, which renders it useful in enamel-painting, and being innocuous, it is now (1860) introduced into paper-hangings instead of the highly dangerous arsenical green pigment. The bichromate of potash is employed in conjunction with sulphuric acid as an agent in bleaching palm-oil and other oils and fats.

**CHRO'NICLE** (from *chronos*, time), denotes a history in which events are treated in the order of time. A C. is understood to differ from annals in being more connected and full, the latter merely recording individual occurrences under the successive years or other dates. Most of our older histories were called chronicles, such as the *Saxon Chronicle*, *Holinshed's Chronicle*. The term is seldom applied to a modern book, but frequently to a newspaper—as, for instance, *The Morning Chronicle*.

**CHRO'NOGRAM**, or **CHRO'NOGRAPH** (Gr. *chronos*, time, and *gramma*, a letter, or *grapho*, I write), a whimsical device of the later Romans, resuscitated during the *renaissance* period, by which a date is given by selecting certain letters amongst those which form an inscription, and printing them larger than the others. The principle will be understood from the following C., made from the name of George Villiers, first Duke of Buckingham:

georgIVs. DVX. bVCkIngaMIæ.

The date MDCXVVVIII (1628) is that of the year in which the duke was murdered by Felton, at Portsmouth.

**CHRONO'LOGY** is the science of the divisions of time. It has two main branches—Mathematical C., and Historical Chronology. Mathematical C. is engaged with such of the units for the measurement of time as begin and end with the period of complete evolution of recurring celestial phenomena. See articles CALENDAR, YEAR, MONTH, DAY, and CYCLE, where the chief points in mathematical C. are explained. Historical C. uses these units among others to measure the distance in point of time between events, and to fix their *dates*. As in geography and navigation, longitude is measured from some arbitrary line, such as the meridian through Greenwich, so in historical C., *dates* are fixed by giving their distance from some arbitrary point of time, usually chosen because of some remarkable occurrence which signalised it. Such a fixed point, or *epoch*, forms the beginning of an *Era*. It is thus that *dates* have been aptly said to be to events in history what the latitude and longitude of places are to the places in geography and navigation. The mathematical, or, to speak more properly, the astronomical units of time above referred to have not been, as has been already hinted, the only units used in historical chronology. In early times, the more accurate methods of mathematics were unknown, and such vague periods as 'a generation,' or the lifetime of leading persons in a nation, such as the priestesses of Juno, or of the kings, were assumed as units in historical chronology. The great variety of eras, too, in ancient times confuses the student of chronology. Thus the era of the Greeks began with the year of the first Olympiad, or that in which Corœbus was victor; being the first celebration of the games at which the victor's name was recorded, and which is calculated to correspond to the year 776 B.C. From this epoch, the Greeks measured time by Olympiads or periods of four years. Thus, the 3d year of the 12th Olympiad would be the year 729 B.C. The Roman era was reckoned from the founding of the city, being either 752 or 753 B.C. The Roman practice of dating events from the building of the city, seems to be the first instance of the method of reckoning time from a fixed point by single years. It thus forms one of the great stages in chronology. Of other eras we shall merely mention the Mohammedan, which commences with the flight of Mohammed, 622 A.D., and which is called the *Hegira* (q. v.). The Roman and Greek methods of measuring time continued to be in use long after the birth of Christ; the Olympiads, indeed, appear to have been employed in Europe down to the 304th Olympiad, or 440 A.D. From 312 A.D., however, the public mode of computation throughout the Roman empire was by indictions, which were periods of 15 years, beginning with that year (see INDICTION); and this mode was at one time almost universally followed in the west. In France, it was not altogether discontinued till the end of the 15th century. The Christian era is said to have been first proposed in the year 527 A.D., and is now universally used in Christendom. Part of the business of C. is to determine the relationships of the different eras, so as to enable one to express, in the language appropriate to one mode of computation, the date of an event recorded in another. Owing to the birth of Christ being a comparatively recent event, the Christian era is attended by this inconvenience, that we must count backwards from it for the dates of occurrences prior to it. To obviate this, various comprehensive periods, such as the Julian and Louisian Periods (q. v.), have been invented, which have the merit of being applicable to most events lying within the limits of history.

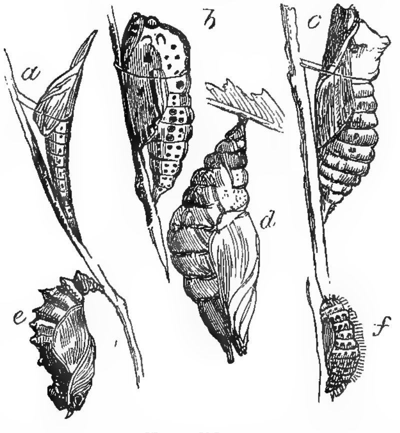
Various systems of C., such as the Chinese, Babylonian, Egyptian, Indian, and Chaldæan, are worthy of attention. Accounts of the periods which these nations respectively assign to their histories, will be found under the heads CHINESE EMPIRE, BABYLON, &c. Of *Sacred* C. there have been various systems. In these the epochs are the Creation of the World, and the Flood; but the chief copies of the Bible do not agree as to the dates of these events. While the Hebrew text reckons 4000 years from the creation to the birth of Christ, and to the flood 1656 years, the Samaritan makes the former much longer, though it counts from the creation to the flood only 1307 years. The Septuagint version differs from both. It removes the creation of the world to 6000 years before Christ, and 2250 years before the flood. These differences have never been reconciled. It is now, however, universally admitted, that the creation of the world is not to be regarded as having occurred even so recently as 6000 B.C. The modern understanding of the first chapter of Genesis leaves the period of the creation quite indefinite, and one scheme of interpretation stretches out the days of creation into periods of indefinite length. Of the *Newtonian* C., all that can be said here is, that it was an attempt, now generally admitted not to have been very successful, to rectify the obvious blunders of ancient chronologers, by determining certain epochs by means partly of astronomical calculations, and partly of the critical examination of such chronicles as measured time by reigns and generations. By a very fine argument, the soundness of which has since been doubted, Newton set down the date of the Argonautic expedition as being 43 years after the death of Solomon, or 937 B.C.

**CHRONO'METER**, or time-measurer, is the name given principally to such time-keepers as are used for determining the longitude at sea. The mechanism is essentially the same as that of a common watch; only the size is generally greater, and additional precautions are taken to secure regularity under changes of temperature and other deranging influences. See HOROLOGY.

**CHRO'NOSCOPE**, an instrument contrived by Mr Wheatstone to measure the duration of certain short-lived luminous phenomena, such as the electric spark, of which the eye itself can be no judge, owing to the persistence of impressions of light on the eye after the cause of sensation has ceased. The phenomenon is observed by reflection in a mirror, in such rapid motion that the image of the luminous object would appear to describe a circle, supposing the luminosity to endure long enough. Should the phenomenon be instantaneous, the image will appear as a mere point; should it last for an appreciable time, the image will form an arc, greater or less, of the circle. The electric spark is found by this test to have no duration.

**CHRU'DIM**, a town of Bohemia, beautifully situated on a small river, about 62 miles south-east of Prague. It is walled, has a noble collegiate church, a high school and Capuchin convent, manufactures of cloth, and very important horse-markets. Pop. 6000.

**CHRY'SALIS**, or **CHRY'SALID**, a name originally Greek, and strictly belonging to those *pupæ* of butterflies which are adorned with golden spots, but extended to the pupæ of lepidopterous insects generally, and even of other orders of insects. The chrysalids of lepidopterous insects are enclosed in a somewhat horny membranous case; sometimes very angular, sometimes nearly round; generally pointed at the abdominal end, sometimes at both ends; and before the caterpillar undergoes its transformation into this state, it often spins for itself a silken cocoon, with which earth and other foreign substances are sometimes mixed, so as to increase its size, and within which the chrysalid is concealed. Chrysalids are often suspended by cords, and generally remain nearly at rest; some have the power of burying themselves in the earth; others are bound by a single silken thread which passes round their middle (see cut); some twirl themselves round when touched, or when the stalk or leaf to which they are suspended is touched; and in general, they give signs of life, when disturbed, by violent contortions of the abdominal part. See INSECT TRANSFORMATIONS; PUPA; LEPIDOPTERA; BUTTERFLY, HAWK-MOTH, MOTH, and SILKWORM.



Chrysalids:
*a*, Orange-tip Butterfly; *b*, Black-veined White Butterfly; *c*, Swallow-tailed Butterfly; *d*, Purple Emperor; *e*, Silver-washed Fritillary; *f*, Duke of Burgundy Fritillary.

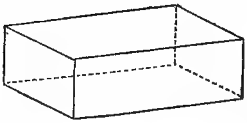
**CHRYSA'NTHEMUM** (Gr. gold-flower), a genus of plants of the natural order *Compositæ*, sub-order *Corymbiferæ;* having a hemispherical or nearly flat involucre, with imbricated scales, which are membranous at the margin, a naked receptacle, the florets of the disk tubular and hermaphrodite, those of the ray strap-shaped and female, the fruit destitute of pappus. The species of this genus are annuals, perennials, or shrubby; and all have leafy stems. They are natives chiefly of the temperate parts of the old world. *C. leucanthemum*, the OX-EYE, or OX-EYE DAISY, is abundant in fields, meadows, and grassy places of woods, in most parts of Europe. It has large flowers, with white ray and yellow disk. It is often a troublesome weed among hay and in pastures; being perennial, and having a creeping brittle root-stock, it is not easily extirpated. It is common in Britain, which has only one other native species, *C. segetum*, CORN MARIGOLD, a frequent weed in cornfields—although rare in the neighbourhood of Edinburgh—an annual, with large deep yellow flowers. It is dealt with like annual weeds in general, by pulling it when young.—*C. carinatum*, an annual species with white ray and dark-red disk, the scales of the involucre keeled, a native of Barbary, is frequently cultivated in green-houses or—where the climate permits—in flower-gardens. The favourite species of the gardener is, however, *C. Indicum*, the CHINESE or INDIAN C., a native of China, Cochin-China, and Japan; which has long been cultivated in its native countries as an ornamental plant, and of which there are many varieties. Its colours are also very various—red, lilac, rose-colour, white, yellow, orange, or two colours combined. It flowers in autumn and winter. It is easy of cultivation, succeeds best in a light rich soil, is easily propagated by cuttings, suckers, or parting the roots, but requires the green-house in Britain. It was introduced in 1789. It is reckoned among florists' flowers.

Chrysanthemum.

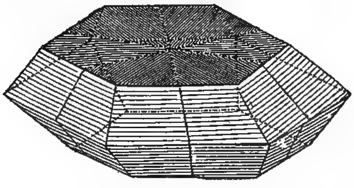
**CHRYSELEPHA'NTINE** (Gr.; from *chrysos*, gold, and *elephas*, ivory), the art of making images of gold and ivory, was extensively practised amongst the Greeks. Winckelmann has calculated that about 100 statues of this kind are mentioned by the ancients. The colossal works executed by Phidias at Athens, in the time of Pericles, are the most famous of this class, the greatest being the Pallas of the Parthenon. It was 26 cubits high, and represented the goddess in armour, covered with a long robe. The famous Olympian Jupiter of Phidias, executed in the same materials, was also a world-wide wonder. The combination of gold and ivory was chiefly used in temple statues; and though the execution of the more famous works of this class belongs to an advanced period of art, the use of various materials in the same statue was very ancient, and probably borrowed from the custom of adorning the wooden images of the earliest time with the precious metals. Sometimes, too, the head, the arms and hands, and the feet were of marble, whilst the rest was of wood, covered with thin plates of gold. These were called Acrolites (*akrolithoi*). See Statuary.

**CHRYSI'PPUS**, an eminent Stoic philosopher, was born about 280 B.C., at Soli in Cilicia. He came to Athens when still a youth, and eagerly addicted himself to philosophical pursuits. His principal master was Cleanthes, although he is said to have also studied under the academic teachers, Arcesilaus and Lacydes, and learned from them what were the objections urged by sceptics against the doctrines of the Stoics. He had the reputation of being the keenest disputant of his age, and was happily described as 'the knife for the academic knots.' In fact, his logic was held to be so convincing, that people were wont to say: 'If the gods make use of dialectic, it can only be that of Chrysippus.' It is also related of him, that he told Cleanthes he merely wanted to know the principles of his system, as he intended to find arguments for them himself; and this story appears to indicate his true position in philosophy. He was not the creator of a new system, but the expounder of an old. C.'s industry was very great. He seldom wrote less than 500 lines a day, and is said to have composed more than 700 works. Many of these, however, were compilations, and were not characterised by great beauty of style. Only a variety of fragments remain, which have been edited by Petersen (*Philosophiæ Chrysippeæ Fundamenta*, Altona and Hamburg, 1827).

**CHRY'SIS**, a Linnæan genus of hymenopterous insects, now constituting a family *Chrysidæ*, allied to the *Ichneumonidæ*, and forming a connecting-link between them and bees, wasps, &c. The French call them *Guêpes dorées* (gilded wasps), and they sometimes receive the English names of *Golden-tailed* and *Ruby-tailed Flies*. They delight in sunshine, and may be seen poised in the air—the motion of their wings being so rapid as to render the body alone of the insect visible.



Right rhomboidal prism; primary form of Chrysoberyl.



A crystal composed of six twins, grouped together laterally, which in transmitted light appears red. From Siberia.

**CHRY'SOBERYL**, a gem almost as hard as sapphire, and the finer specimens of which are very beautiful, particularly those which exhibit an opalescent play of light. Lapidaries sometimes call it oriental or opalescent chrysolite. It is of a green colour, inclining to yellow, semi-transparent, or almost transparent, and has double refraction. It occurs crystallised in six-sided prisms; often in macles, or twin crystals. It is found in granite, in sandstone, and in alluvial soil; in Ceylon, Pegu, Siberia, Brazil, and Connecticut. It is composed of alumina, glucina, and a little protoxide of iron; the alumina being about 80 per cent. of the whole.

**CHRYSOCO'LLA**, or **COPPER-GREEN** (Gr. gold-glue), an ore of copper, found in Cornwall and in many parts of the world, but particularly in Wisconsin and Missouri, where it is so abundant as to be worked for copper. As a pigment, it was much used by the ancients.

**CHRY'SOLITE** (Gr. golden-stone), a mineral composed of silica, magnesia, and protoxide of iron; of a fine green colour, with vitreous lustre; transparent, and having double refraction; in hardness, about equal to quartz; and with conchoidal fracture. It often crystallises in four-sided or six-sided prisms, variously modified. Very fine specimens are brought from Egypt and from some parts of the east, also from Brazil. C. is used by jewellers as an ornamental stone, but is not highly valued. *Olivine*, which occurs generally massive, in grains and roundish pieces, and is frequent in volcanic countries, and found in the igneous rocks of some parts of Scotland—as on Arthur's Seat—is regarded as a coarse variety of chrysolite.—The Chrysoberyl (q. v.) is sometimes called C. by jewellers.

**CHRYSOLO'RAS**, Manuel, a learned Greek of Constantinople, was born in the middle of the 14th century. He is regarded as the first who transplanted Greek literature into Italy. About the year 1391, the Byzantine emperor, John Palæologus, sent C. to England and Italy to entreat assistance against the Turks. This mission made C. known in Italy, and, in 1397, he left his native land and went to Florence, where, as teacher of Greek literature, he was highly esteemed and admired. Leonardo Bruno, Poggius, Philelphus, Guarinus of Verona, and other eminent scholars were pupils of his. He was afterwards employed in public services—especially in mediating a union of the Greek with the Roman Church—by Pope Gregory XII. In 1413, C. went with John XXII. to the council of Constance, where he died 1415. Besides theological works, his *Erotemata*, or 'Accidence of the Greek Language' (Venice, 1484), has been preserved.—Manuel C. must be distinguished from his nephew, John Chrysoloras, who also went to Italy and gave lessons in Greek.

**CHRYSOMELA** and **CHRYSOMELINÆ**. See Golden Beetle.

**CHRYSOPHYLLUM**. See Sapotaceæ, Monesia Bark, and Star Apple.

**CHRY'SOPRASE** is merely a variety of chalcedony, but is valued far above common chalcedony as an ornamental stone; so that a stone of this kind, fit for mounting in a ring, is worth from £10 to £20. It is of a fine apple-green colour in choice specimens, but inferior ones exhibit other shades of green, and it is sometimes spotted with yellowish-brown. It is often set in a circlet of diamonds or pearls. Unfortunately, it is apt to lose its colour through time, particularly if kept in a warm place; but dampness is favourable to its preservation, and it is therefore sometimes kept in damp cotton. It is found in Lower Silesia—where the search for it was particularly encouraged by Frederick the Great—and in Vermont. The inferior specimens are made into brooches, necklaces, &c.; and those still coarser, into snuff-boxes, seals, cups, &c.—The C. of the ancients was a stone of yellowish-green colour, but it is not certain what it was.

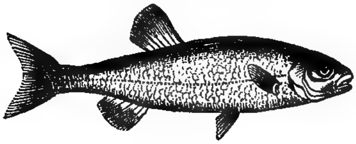
**CHRY'SOPS.** See Cleg.

**CHRY'SOSTOM,** John (Gr. *Chrysostomos*, golden-mouth; so named from the splendour of his eloquence), was born at Antioch in 347 A.D. His mother Anthusa was a pious woman, wholly devoted to her son, who grew up under her loving instructions into an earnest, gentle, and serious youth, passing through, as Neander significantly observes, none of those wild, dark struggles with sinful passions which left an ineffaceable impress on the soul of Augustine, and gave a sombre colouring to his whole theology. He studied oratory under Libanius, a heathen rhetorician; soon excelled his teacher; and, after devoting some time to the study of philosophy, retired to a solitary place in Syria, and there read the Holy Scriptures. The ascetic severity of his life and studies brought on an illness which forced him to return to Antioch, where he was ordained deacon by Bishop Meletius in 381, and presbyter by Bishop Flavianus in 386. The eloquence, earnestness, and practical tone of his preaching excited the attention of Jews, heathens, and heretics, and secured for him the reputation of the chief orator of the Eastern Church. In 397, the eunuch Eutropius, minister of the Emperor Arcadius, who had been struck by the bold and brilliant preaching of C., elevated him to the episcopate of Constantinople. C. immediately began to restrict the episcopal expenditure in which his predecessors had indulged, and bestowed so large a portion of his revenues on hospitals and other charities, that he gained the surname of 'John the Almoner.' He also endeavoured to reform the lives of the clergy, and sent missionaries into Scythia, Persia, Palestine, and other lands. His faithful discharge of his duties, especially in reproof of vices, excited the enmity of the patriarch Theophilus and of the Empress Eudoxia, who succeeded in deposing and banishing him from the capital. He was soon recalled, to be banished again shortly afterwards. He now went to Nicæa, in Bithynia; but was from thence removed to the little town of Cucusus, in the desert parts of the Taurus Mountains. Even here his zeal was not abated. He laboured for the conversion of the Persians and Goths in the neighbourhood, and wrote the seventeen letters (or rather moral essays) to Olympias, to whom he also addressed a treatise on the proposition—'None can hurt the man who will not hurt himself.' The emperor, enraged by the general sympathy expressed towards C. by all true Christians, gave orders that he should be more remotely banished to a desolate tract on the Euxine, at the very verge of the Eastern Roman empire. Accordingly, the old man was made to travel on foot, and with his bare head exposed to a burning sun. This cruelty proved fatal. C. died on the way at Comanum, in Pontus, September 14, 407 A.D., blessing God with his dying lips. The news of his death excited much sorrow among all pious Christians, for C. was a man who drew the hearts of his fellows after him; a lovable, manly Christian, hating lies, worldliness, hypocrisy, and all manner of untruthfulness, with that honest warmth of temper which all vigorous people relish. A sect sprang up after his death, or martyrdom as they conceived it, called *Johannists*, who refused to acknowledge his successors; nor did they return to the general communion till 438, when the Archbishop Proclus prevailed on the Emperor Theodosius II. to bring back the body of the saint to Constantinople, where it was solemnly interred, the emperor himself publicly imploring the pardon of Heaven for the crime of his parents, Arcadius and Eudoxia. The Greek Church celebrates the festival of C. on the 13th of November; the Roman, on the 27th of January. In his *Homilies* (Thomas Aquinas said he would not give in exchange those on St Matthew for the whole city of Paris) C. displays superior powers of exegesis. In general, he rejects the allegorical system of interpretation, and adheres to the grammatical, basing his doctrines and sentiments on a rational apprehension of the letter of Scripture. He is, however, far from being a bibliolater. He recognised the presence of a human element in the Bible as well as a divine; and instead of attempting, by forced and artificial hypotheses, to reconcile what he thought irreconcilable in Scripture statements, he frankly admitted the existence of contradictions, and shaped his theory of inspiration accordingly. But his greatest and noblest excellence lay in that power, springing from the fervour and holiness of his heart, by which the consciences of the proud, the worldly, and the profligate were awakened, and all were made to feel the reality of the gospel message. The surname C. was first applied some time after his death, and, as it is supposed, by the sixth œcumenical council in 680. C.'s works are very numerous, and consist of, 1st, *Homilies*, on parts of Scripture and points of doctrine; 2d, *Commentaries*, on the whole Bible (part of which has perished); 3d, *Epistles*, addressed to various people; 4th, *Treatises*, on different subjects (such as Providence, the Priesthood, &c.); and 5th, *Liturgies*. Of these the most valuable, as well as the most studied, are the *Homilies* which are held to be superior to everything of the kind in ancient Christian literature.

The most correct Greek edition of C.'s works is that by Henry Savil (8 vols., Eton, 1613); and the most complete Greek and Latin edition is that by Montfaucon (13 vols., Par. 1718—1738; republished in 1834—1840). The best authority in regard to C. is Neander, who, besides treating of his life and labours in his *Kirchengeschichte*, has published a life of this eminent Father.

**CHRY'SOTYPE** (Gr. *chrysos*, gold; *typos*, impression), a photographic process invented by Sir John Herschel, and depending for its success on the reduction of a persalt of iron to the state of protosalt by the action of light, and the subsequent precipitation of metallic gold upon this protosalt of iron. The process is conducted as follows: Good paper is immersed in a solution of ammonio-citrate of iron of such a strength as to dry into a good yellow colour, without any tinge of brown in it. It is then exposed to light under a negative until a faint impression is obtained. A neutral solution of chloride of gold is then brushed over the paper, when the picture immediately appears, and is rapidly developed to a purple tint. It should then be freely washed in several changes of water, fixed with a weak solution of iodide of potassium, again thoroughly washed, and dried. The action of the iodide of potassium is to convert any unaltered chloride of gold into a soluble double iodide of gold and potassium, thus rendering the picture permanent.

**CHUB** (*Leuciscus Cephalus*), a fish of the family *Cyprinidæ*, of the same genus with the roach, dace, bleak, minnow, &c. See Leuciscus. The colour is bluish-black on the upper parts, passing into silvery white on the belly; the cheeks and gill-covers rich golden yellow. The C. rarely attains a weight exceeding 5 lbs. It is plentiful in many of the rivers of England, and occurs in some of those of the south-west of Scotland. In the rivers of Cumberland it bears the name of *Skelly*, supposed to have reference to the size of its scales; but the Schelly of Ullswater Lake is the Gwyniad, and the C. is there called the *Chevin.* It is found in many rivers of the continent of Europe; being the *Jentling* or *Bratfisch* of the Danube, and the *Jese* of the Oder. It spawns in April and May. It is not in great esteem for the table.



Chub.

The C. rises well at a fly, and takes freely a variety of baits. The same baits and the same means of fishing may be employed as for the barbel and bream. The C. is very fond, moreover, of slugs, grasshoppers, cockchafers, and humble-bees. The latter two are to be used either naturally, by means of dibbing or dapping, or, being imitated, may be used artificially, and cast as a fly. The best flies for the C. are large red, black, and brown palmers, with the hackles laid on thickly. The best places to fly-fish for C. are close under overhanging boughs at the sides of streams, or against piles, or other places where they can get some shelter, for the C. is somewhat shy and easily alarmed. He is a bold riser, and when he comes at a fly seldom fails to hook himself. Of all the baits for bottom-fishing, he prefers greaves, cheese, and worms; and the fatter the bait the better he likes it. He will occasionally run at a minnow, and is often taken on a spinning bait. The C. spawns in May, and comes into condition again by the end of June or early in July; bites best, and is in the best condition for bottom-fishing, in October and November. When first hooked, he makes a great dash, but he very soon gives in. Some years ago, the scales of the C. were in much request, in common with those of the bleak, for artificial pearl-makers.

**CHUBB**, THOMAS, an English rationalist, who wrote on religious questions during the first half of the last century, was born at East Harnham, in Wiltshire, in 1679. He received but a meagre education in youth, and after an apprenticeship to a leather glove and breeches maker in Salisbury, he became a tallow-chandler, in which business he continued to the end of his life. His first work, published in 1715, was entitled *Supremacy of God the Father Vindicated.* Besides this, he wrote a multitude of treatises on other religious subjects. Among these may be mentioned: *A Discourse on Reason, as a sufficient Guide in matters of Religion; On Sincerity; On Future Judgment and Eternal Punishment; Inquiry about Inspiration of the New Testament;* and *Doctrine of Vicarious Suffering and Intercession Refuted.* C. died in 1746.

**CHUCK-WILL'S-WIDOW** (*Antrostomus Carolinensis*), a bird of the Goatsucker family (*Caprimulgidæ*), a native of the southern parts of the United States. It has received its singular name from its note, which resembles these words or syllables articulated with great distinctness, and is repeated like that of the cuckoo, or of its own congener, the Whip-poor-will (q. v.).

**CHU-LAN.** See CHLORANTHACEÆ.

**CHUMBU'L**, a river rising in the Vindhyan Mountains, which form the southern limit of the basin of the Ganges. Its source, at a height of 2019 feet above the sea, is in lat. 22° 26′ N., and long. 75° 45′ E. During a generally north-east course of 570 miles, it receives many tributaries on both sides, till, in lat. 26° 30′ N., and long. 79° 19′ E., it enters the Jumna from the right, with such a volume of water, that, when itself flooded, it has been known to raise the united stream 7 or 8 feet in twelve hours. The C. is remarkable, here and there, for the wildness of its current and the picturesque character of its banks.

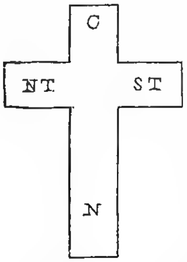
**CHUNARGU'RH**, a fortified town on the right bank of the Ganges, 16 miles to the south-west of Benares, in lat. 25° 5′ N., and long. 83° E. It is in the district of Mirzapore, and sub-presidency of the North-west Provinces. The population of the native quarter is stated at 11,058. The fortress, which occupies the summit of a sandstone rock, contains the commandant's house, the hospital, the prison, and an ancient palace, with a deeply excavated well of indifferent water. The river in front is navigable at all seasons for vessels of 50 or 60 tons.

**CHUQUISA'CA**, or **SU'CRÉ**, the capital of Bolivia or Upper Peru, in lat. 19° 20′ S., and long. 65° 30′ W. It is situated on a table-land about 9000 feet above the sea, and has a pleasant climate. The town is well built, has a cathedral of great magnificence, a university, a college of arts and sciences, and a mining-school. C. was founded in 1538 by Pedro Auzures, an officer of Pizarro's, on the site of an old Peruvian town called 'Choque Chaka,' or 'Bridge of Gold,' 'the treasures of the Incas having passed through it on their way to Cuzco.' At one time, C. bore the name of La-Plata, on account of the rich silver-mines in its vicinity. Pop. (in 1858) 23,979. C. gives name to a territory containing about 150,000 inhabitants, of whom about 35,000 are Indians. It has five silver-mines in operation; and in it are magnificent ruins of unknown origin. The second name is derived from the general who, in December 1824, fought and won the last great battle for colonial independence at Ayacucho.

**CHURCH**, a word which signifies either a place of Christian worship, or a collective body of Christian people. It is, in all probability, derived from the Greek adjective *kyriakos* (from *kyrios*, lord), the place of worship having been called *the Lord's house*, and the worshippers *the Lord's people.* The Scottish *kirk*, the German *kirche*, &c., are merely different forms of it.

Under the terms APSE and BASILICA (q. v.), we have already explained that the earliest ecclesiastical structures of the Christians were copied or adapted not from the heathen or Jewish temple, as might have been anticipated, but from that peculiar combination of a hall of justice and a market-place to which the name basilica was given by the ancients. The reason of this selection is probably to be found, not so much in the spirit of opposition which no doubt existed between Christians and heathens, as in the essentially different conceptions which they formed of the character and objects of public worship. The rites of heathendom were performed exclusively by the priest, the people remaining without the temple; and the temple itself, which was lighted only from the door, or by the few lamps which burned around the image of the god, was regarded not as a receptacle for worshippers, but as the abode of the deity. The dark mysterious character which thus belonged to it, rendered it equally unsuitable for the performance of liturgical services in which the people were to participate, and for the delivery of those public addresses which from the beginning were employed as a means of Christian teaching and exhortation. To such purposes the prætor's court-room, with its surroundings, were readily adapted, by the few simple alterations which we have described in the articles referred to. But the basilica, as thus altered, was a mere utilitarian structure. It served the purposes of Christian worship, but there was nothing in its form which responded to the feelings of Christian worshippers or tended to awaken Christian sentiments. Now, the Cross (q. v.) had been used by Christians from a very early period to indicate their allegiance to the author of their salvation and the object of their faith; and gradually it had become the distinctive emblem of Christianity. Nothing, then, could be more natural than that when it became desirable to give distinctively Christian characteristics to what hitherto had been a heathen structure, this should be effected by such a modification of its form as should convert it into a representation of this sacred emblem. Nor did this alteration lead to any very extensive change on the form of the C., as it had hitherto existed. The basilica, as we have already explained, not unfrequently had side entrances, either in place of, or in addition to, that from the end. All that was requisite, then, to convert the simple parallelogram of which it consisted into a cross, was, that at each side of the building these entrances, in place of direct communications with the exterior, should be converted into passages, or arms running out at right angles, and more or less prolonged, according as the object was to attain the form of a Greek or of a Latin cross (see Cross). If the C. was to be in the form of a Greek cross, the arms were made of the same length with the other two portions into which they divided the building; whereas if the cross was to be a Latin one, the portion of the building which ran towards the west was made considerably longer than either of the others. In either case, the arms running at right angles to the C., and directly opposite to each other, cut it across, and thus obtained the name of *transepts.*

The external form of the C. being thus indicated, we now proceed to explain its internal arrangements, and to enumerate the various adjuncts which in cathedrals and others of the larger churches frequently sprang up around it.



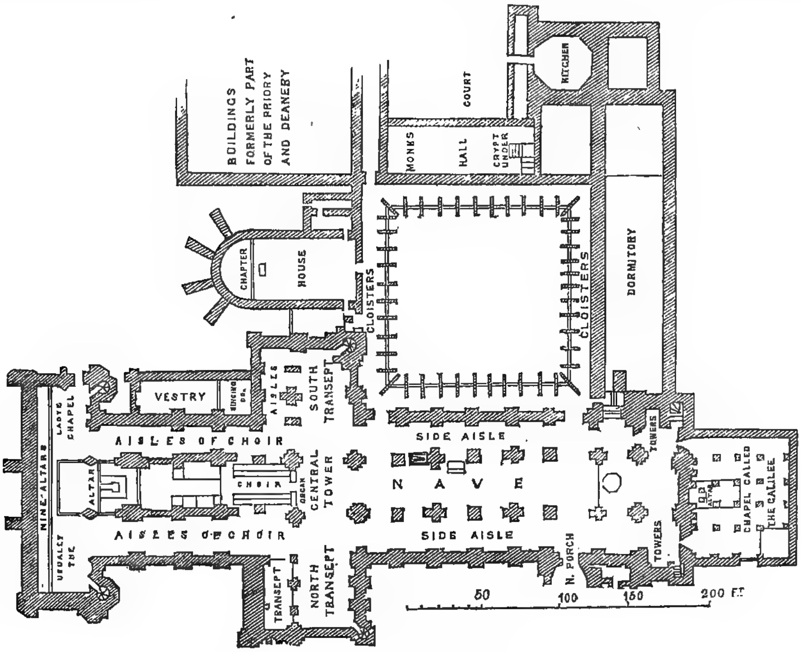
Church:
C = Choir; N. T. = North Transept; S. T. = South Transept; N. = Nave.

Over the point at which the arms or transepts intersect the body of the cross, a central tower or spire is very frequently erected. From this central tower, or, if the tower or towers are situated elsewhere, from this central point, the portion of the building which runs westward, to where the Galilee or entrance chapel, or, in other instances, the great entrance-door is situated, is called the Nave (from *navis*, a ship), whilst the portion which runs eastward to where the altar, or high-altar, if there be several, is placed, is called the Choir. In the larger and more complete churches, the nave, and frequently also the choir, are divided longitudinally by two rows of pillars into three portions, the portion at each side being generally somewhat narrower and less lofty than that in the centre. These side portions are called the aisles of the nave, or of the choir, as the case may be. In some churches, the aisles are continued along the transepts, thus running round the whole C.; in others, there are double aisles to the nave, or to both nave and choir, or even to nave, choir, and transept. Behind, or to the east of the choir, is situated the Ladye's Chapel, or Chapel of the Virgin, with sometimes a number of altars; and it is not unusual for side chapels to be placed at different places along the aisles. These usually contain the tombs of the founder, and of other benefactors to, or dignitaries connected with, the church. The extent to which these adjuncts exist depends on the size and importance of the C., and they are scarcely ever alike in two churches, either in number, form, or position. Vestries for the use of the priests and choristers generally exist in connection with the choir. Along the sides of the choir are ranged richly ornamented seats or stalls, usually of carved oak, surmounted with tracery, arches, and pinnacles; and amongst these seats, in the case of a bishop's church, the highest and most conspicuous is the so-called *cathedra*, or seat for the bishop, from which the cathedral takes its name. The larger English cathedral and abbey-churches have usually a chapter-house attached to them, which is of various forms, most commonly octagonal, and is often one of the richest and most beautiful portions of the whole edifice. On the continent, chapter-houses are not so common, the Chapter (q. v.) being usually held in the cathedral itself, or in one of the chapels attached to it. Cloisters (q. v.) are also frequent, and not unusually the sides of those which are furthest removed from the C. or chapter-house, are enclosed by other buildings connected with the establishment, such as a library, and places of residence for some of the officials of the cathedral. It is here that, in Roman Catholic churches, the hall, dormitories, and kitchens for the monks are commonly placed. Beneath the C. there is frequently a Crypt (q. v.). In some cathedral churches, the crypt is in reality a second underground C. of great size and beauty. The Baptistery (q. v.) is another adjunct to the C., though frequently forming a building altogether detached. Most of the parts of the C. which we have mentioned may be traced on the annexed ground-plan of Durham Cathedral; but it must not be supposed that their position is always that which is there represented. The position of the nave, choir, or chancel, aisles, and transepts are nearly invariable, but the other portions vary, and are scarcely alike in two churches.

Churches are of five classes—metropolitan, cathedral, collegiate, conventual, and parish churches—and of these the first are, generally speaking, the most, and the last the least elaborate. In ordinary language, any building set apart for religious ordinances is called a church, though when of a minor kind it is more usually designated a chapel. After a long period of neglect and poverty of taste, the building of churches in a superior style, emulative of the older styles of architecture, has greatly revived, not only as regards the Church of England, but the Church of Scotland and nearly all dissenting bodies.

As applied to a collective body of Christian people, the word C. is the translation and equivalent of the Greek word *ecclesia* (Lat. *ecclesia*, Fr. *église*), used in the New Testament. It is common among Protestants to distinguish between the *visible* and the *invisible* C.—the invisible C. consisting of all those who are savingly or spiritually united to Christ, that is, of all true believers; the visible C. consisting of all who profess the religion of Jesus Christ. Roman Catholics do not in the same manner acknowledge the distinction between the visible and the invisible C., but regard a connection with the hierarchy, and consequent participation of ordinances, as establishing a connection with the true C. and with Christ. Protestants regard the C. as subsisting from age to age, in virtue of the authority of Christ, and through the faith of individual believers and their confession of him: Roman

Catholics regard the apostolical succession of the hierarchy, and the regular administration of the sacraments, as essential to the continued existence of that *Catholic* or universal C. which Christ planted on the earth, and the existence of which he has promised to maintain throughout all ages. Protestants, in general, regard the C. of Rome and the Greek C. as forming part of the visible C. of Christ; but Roman Catholics are not accustomed to make a corresponding admission with respect to the Protestant churches. From the hierarchical principle of the C. of Rome and of the Greek C., results an employment of the term C. to designate the hierarchy alone, which is contrary to the principles of the Reformation, although a tendency to it may be observed in some Protestant churches. It has been usual for Protestants to designate by the term C. the collective body of Christians in a particular country, distinguished by the name of that country; the greater number of Protestants (Episcopalians and Presbyterians) believing that such a portion of the universal C. may warrantably be associated under a common government; and in countries where religious liberty exists, diversities of opinion on points of doctrine and C. government have given rise to the existence of separate Christian associations, distinguished by names generally indicative of some of the peculiarities which characterise them; but these, however much they may differ on many points, do not in general hesitate to recognise each other as belonging to the universal visible C. of Christ, whilst they retain in common the same great first principles of the Christian faith, and particularly the belief in one God and in the three persons of the Godhead, the incarnation of the Son of God, the atonement by Jesus Christ, and the work of the Holy Spirit. The term C., however, is regarded by Independents (q.v.) or Congregationalists, as more strictly applicable to those who are united as worshippers in a particular place of worship, partaking of the Lord's Supper together, and exercising discipline and C. government among themselves.



Ground-plan of Durham Cathedral.

**CHURCH, States of the.** See Papal States.

**CHURCH-DISCIPLINE** (*Disciplina ecclesiastica*) includes all the means employed by the Christian Church, besides the ministration of word and sacraments, to secure on the part of its office-bearers and members a faithful adherence to their profession and a corresponding blamelessness of life. It rests upon the authority of Christ, and at the same time necessarily arises, in some form of it, out of the very constitution of the church as a society. Among the early Christians, it soon assumed forms of great severity towards offenders, especially towards the *Lapsed* (q. v.). At a later period, the discipline of the church was chiefly exercised with respect to persons accused of heresy and schism. The penances of the Church of Rome have long formed an important part of its discipline, and therewith its *Indulgences* (q. v.) are closely connected, as well as its doctrine and rule of *Auricular Confession* (see Confession). In the Protestant churches, public confession of sins by which public scandal has been given, and submission to public rebuke, are sometimes required. Practices more analogous to those of the primitive church were established in many churches after the Reformation, but in general have fallen greatly, or entirely, into disuse. The power of exclusion from the Lord's Supper, and from the rights and privileges of church membership, is, however, generally retained and exercised, until, by profession of repentance, and by reformation of life, the cause of such exclusion is removed; and ministers or other office-bearers are, upon offence given in their doctrine or conduct, suspended from their functions, or altogether deposed from their office. The exercise of C. D. belongs more or less exclusively to a hierarchy, or to the office-bearers assembled in church-courts, or to the members of each congregation, according as the church is Episcopalian, Presbyterian, or Independent in its church-government. There is an increasing tendency among Christians in general, to scrutinise closely the claim of right to exercise C. D., and the limits within which it may be exercised.

**CHURCH GOVERNMENT.** The Christian Church, like every other society, must have a certain constitution and rules according to which its affairs are administered. It is disputed, however, among Christians, how far this constitution has been defined, or these rules prescribed by divine authority, and how far they have been left to the discretion of men. The form of C. G. depends primarily on the idea entertained of the constitution of the church. Congregationalists, or Independents (q. v.), accordingly place all C. G. in the hands of the members of the congregation and, the office-bearers' whom they have elected. This theory of C. G. is maintained by many Baptists and others, who, for various reasons, assume different denominations.—Episcopalians and Presbyterians agree that many congregations are to be united under a common government; but this, according to Presbyterians, is properly carried on by ministers and elders of these congregations meeting for this purpose on a footing of equality; whilst, according to Episcopalians, it is more or less absolutely in the hands of bishops, who are superior to the mere pastors of congregations. See Episcopacy and Presbyterianism.

**CHURCH HISTORY, or ECCLESIASTICAL HISTORY.** The history of the Christian religion and church forms one of the most important parts of the general history of mankind, and is intimately connected not only with the political history of the world, but with the history of philosophy, of literature, and of civilisation. The sources and authorities are extremely various, and their due appreciation often requires as much judgment as their exploration requires toil. C. H. is either general—embracing a view of the affairs of the church in the whole world from the beginning to the present day—or particular, relating to some particular country, or time, or portion of the church. By some authors, it has been treated chiefly with regard to the outward affairs of the church; and by others, with reference to doctrine, morals, and the evidences of spiritual life; whilst others still have devoted their attention chiefly to the forms of worship, the constitution of the church, and other things generally comprehended under the name of Ecclesiastical Antiquities. All these, of course, have important relations to each other. The earliest writers of C. H. were in general mere chroniclers, following the order of time; in the great work of the Magdeburg Centuriators, a method was adopted, of which there had been previous examples, and which afterwards became frequent, of treating each century separately, the centuries being subdivided according to convenience of subjects; but arrangements less mechanical and arbitrary have been adopted by the most eminent modern authors. With much diversity on minor points, there is a general agreement in dividing the whole history of the church into three great periods: the first, from our Saviour to the time of Constantine; the second, from that time to the Reformation; and the third, from the Reformation to the present day.

The earliest facts of C. H. are to be learned only from the New Testament, after which, however, the epistles and other writings of the apostolic and other primitive fathers, afford sources of information, unfortunately very scanty; Hegesippus, who wrote about the middle of the 2d c., has transmitted to us some very imperfect memorials of these early times; but the first proper ecclesiastical history is that of Eusebius of Cæsarea (324). This work was continued to the 5th c. by Socrates Scholasticus, Hermias Sozomenus, and Theodoret. Similar compilations were executed by Lactantius, Epiphanius, Hieronymus, Theodoret of Cyrus, Philostorgius, and Zosimus. In the 6th c., the chief ecclesiastical historians are—Theodorus Lector, Evagrius, and Nicephorus Callistius; in the 8th, the Venerable Bede and Paul Warnefried; in the 9th, Theophanes Confessor, Claudius of Turin, Haymo of Halberstadt, Scotus Erigena, and Hinkmar of Rheims; in the 12th and 13th, Photius, Simeon Metaphrastes, Theophylact, Matthew Paris, Albert of Strasburg, and Ptolemy of Lucca; in the 15th, Laurentius Valla is the most conspicuous name. Protestant writers were the first to treat C. H. in a critical and scientific manner. This was natural, for their position as apparent schismatics compelled them to vindicate historically the changes which they had wrought in the character of the church. Hence their writings were of an apologetic and polemical cast. The first work of this kind was the *Magdeburg Centuries* (see Century), published by Matthias Flacius. Special histories of the Reformation were composed by Sleidan and Seckendorf. In the 17th c., Calixtus distinguished himself in this department, and after him Thom. Illig, Adam Rechenberg, and Thomasius. The new life that awoke in Germany towards the middle of the 18th c., produced a multitude of church-historians, of whom we can only afford to mention Arnold, C. M. Pfaff, Mosheim, Semler, and J. Matth. Schröckh; while in still more recent times, Marheineke, Danz, Neander, Gieseler, and Hagenbach, have achieved the highest distinction in the same sphere of labour. But others besides the Lutheran divines have rendered valuable services to church history. The Reformed Church boasts the eminent names of Du Moulin, Joh. Dalläus, Blondel, Hottinger, Spanheim, Turretin, Venema, Jablonski, and recently, D'Aubigné; while among Englishmen, Usher, Pearson, Bingham, Lardner, and recently, Milman and Maurice, have won a distinguished place. Scotland has few names, the chief being Calderwood, Wodrow, M'Crie, and recently Cunningham. In the Roman Catholic Church, since the period of the Reformation, ecclesiastical historians have rarely manifested a dispassionate and philosophic spirit. They have appeared mainly in the character of defenders of the papacy. The greatest names in C. H. in Catholic France are Tillemont, Bossuet, Bayle, Du Pin, Thomassin, and Fleury. Among the Italians may be mentioned Orsi, Saccharelli, Pallavicini, Guicciardini, and Muratori; and among the Roman Catholics of Germany, Dannenmayr, Count Stolberg, Ritter, Hortig, Döllinger, &c.

For the benefit of the English reader, it may be stated that the extensive, profound, and philosophic work of Dr Augustus Neander has been translated from the original German into English, and is published in 10 vols. by Bohn.

**CHURCH RATES,** in England, a tax or assessment laid on the parishioners and occupiers of land within a parish, by a majority of their own body in vestry assembled, for the purpose of upholding and repairing the fabric of the church and the belfry, the bells, seats, and ornaments, the churchyard fence, and the expenses (other than those of maintaining the minister) incident to the celebration of divine service. The parishioners are convened for this purpose by the Church-wardens (q. v.). The Chancel (q. v.) being regarded as belonging peculiarly to the clergy, the expense of maintaining it is laid on the rector or vicar, though custom frequently lays this burden also on the parishioners, as in London and elsewhere.

The C. R. were anciently a charge on the tithes of the parish, which were divided into three portions: one for the structure of the church, one for the poor, and the third for the ministers of the church. This distribution is said to have originated with Pope Gregory, who enjoined St Augustine thus to divide such voluntary offerings as might be made to his missionary church in England. A canon of Archbishop Ælfric in 970, and an act of the Wittenagemote in 1014, in Ethelred's time, have been quoted in proof of the recognition of this rule by our Saxon fathers. It seems to have been their custom, also, to devote to the repair of each church a portion of the fines paid for offences committed within the district attached to it; and every bishop was bound to contribute to the repair of his own church from his own means. A third of the tithes thus originally devoted to the repairs of churches, continued to be applied to that purpose under the Normans, down to the middle of the 13th c.; and the manner in which this burden came to be shifted to the parishioners, has been a subject of much discussion among legal antiquaries. Lord, then Sir John, Campbell, who published a pamphlet on the subject in 1837, is of opinion that the contributions of the parishioners were at first purely voluntary, and that the custom growing, it at last assumed the form of an obligation, and was enforced by ecclesiastical censures. The care of the fabric of the church, and the due administration of its offices, are laid upon the ministers and the church-wardens conjointly, and the latter may be proceeded against by citation, in the ecclesiastical courts, should they neglect these duties. But there is no legal mode of compelling the parishioners as a body to provide the rate; and this circumstance has occasioned much difficulty in imposing the tax in parishes in which dissent is prevalent, and led to many churches falling into a partially ruinous condition. The proper criterion for the amount of C. R. is a valuation of the property within the parish, grounded on the rent that a tenant would be willing to pay for it. Glebe land, the possessions of the crown in the actual occupation of the sovereign, and places of public worship, are not liable for C. R.; but there is no other exception as regards immovable property, and in some parishes, custom even extends it to stock in trade. It has been often decided in the courts that a retrospective church-rate—i. e., a rate for expenses previously incurred—cannot be validly imposed. Much difficulty has been experienced in recovering the rates imposed by the parish on individuals refusing to pay. Previous to 53 Geo. III. c. 127, the only mode was by suit in the ecclesiastical court. That statute, however, in all cases under £10, empowered the justices of the peace of the county where the church was situated, on complaint of the church-wardens, to inquire into the merits of the case, and order payment. Against the decision of the justices, an appeal lies to the quarter-sessions. Several later statutes, having for their object the promotion of church-building, have extended the common-law powers of church-wardens. There are few social arrangements in England that have been the cause of greater irritation than that by which the duty of providing for the maintenance and repair of the churches of the establishment is thus laid equally upon its members, and upon the members of the various dissenting bodies which everywhere abound. Since the first bill for the abolition of C. R. was introduced by Lord Althorp, as Chancellor of the Exchequer in Lord Grey's government in 1834, scarcely a session has passed in which some attempt has not been made at legislation on this troublesome subject. Even so recently as the session of 1859—1860, a measure which received the approval of the Commons, did so by a majority so narrow as to warrant the Peers in at once rejecting it. In Scotland, the burden of upholding the parish churches is by custom imposed on the heritors of the parish; and where the parish is partly within burgh and partly in the country, the expense must be borne by heritors and proprietors of houses, in proportion to their real rent. Though very little is said on the subject in Scotland, the question of C. R. really stands on the same footing in both countries, and an 'Anglican' heritor in Scotland would have as much reason for refusing to pay the customary parish burdens as a dissenter possessing ratable property in England has for refusing to pay the church-rates. See Scotland, Church of; see also Dissenters, and Parish.

**CHURCH ROAD.** See Road.

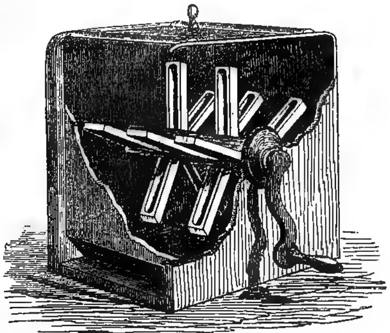
**CHU'RCH-WARDENS**, in England, are ecclesiastical officers, elected sometimes by the parishioners and minister jointly, sometimes by the minister alone, and sometimes by the parishioners alone, for the purpose of protecting the edifice of the church, superintending the celebration of public worship, and to form and execute other parochial regulations. They are generally two in number. See Church-rates, Parish, Vestry, Seats in Churches.

**CHU'RCHILL**, Charles, an English poet, now remembered almost as much for his profligacy as for his poetry, was born at Westminster, where his father was a curate, in 1731. He was educated at Westminster School, and in his 17th year made a clandestine marriage. In 1756 he was ordained, and two years afterwards, succeeded his father as curate of St John's, Westminster. Soon after his transference here, he fell into habits very ill-becoming his clerical character. In 1761, he published (at his own risk, the booksellers having refused him five guineas for it) *The Rosciad*, a satire on theatrical managers and performers, which displayed much critical acumen, clever sarcasm, and no little humour, and enjoyed such an immense success, that C., who on its publication had withheld his name, was soon delighted to avow himself author. In the same year appeared *The Apology*, a bitter satire on some of his critics, which added alike to his purse and his notoriety. He now totally neglected the duties of his office, was a constant attender at theatres, and altogether led a most dissolute life. His parishioners were scandalised, and his dean remonstrated, whereupon C., to shew his utter contempt for the ministerial profession, appeared in a blue coat, gold-laced hat and waistcoat, and large ruffles. He was obliged, however, to resign his preferment, which pecuniary sacrifice was little, as his works brought him considerable sums. He further displayed the complete licentiousness of his nature by separating from his wife, and seducing the daughter of a tradesman in Westminster, and by endeavouring to excuse his vices in a poem called *Night*, on the ground that avowed profligacy was more harmless than profligacy practised in concealment. The boon-companion of as great a debauchee as himself—Wilkes—he contributed to the pages of the *North Briton;* among other things, *The Prophecy of Famine, A Scots Pastoral*, one of the best of his satires. Among his other works, all more or less satirical, are the *Epistle to Hogarth*, *The Author*, *The Candidate*, *The Ghost*, *Gotham*, *The Duellist*, &c., of which *The Author* is the best. He died November 4, 1764, while on a visit to Wilkes at Boulogne. C.'s thorough reprobacy has naturally, though unfairly, led to injustice being done to his poetical abilities, which were very considerable.

**CHURCHING OF WOMEN**, a religious usage prevailing in the Christian Church from an early period, of women, on their recovery after child-bearing, going to church to give thanks. It appears to have been borrowed from the Jewish law (Lev. xii. 6). In the church of the early ages, it was accompanied with various rites; and in the Church of Rome and Greek Church, it is imperative. In the Church of England, also, a service for the C. of W. finds a place in the Liturgy. By the Presbyterian and Independent churches of Britain, it is rejected, as having no scripture warrant.

**CHU'RCHYARD.** See Burial, Cemetery.

**CHURN**, a machine for agitating milk or cream for the production of butter. The principle of the operation is considered in the article on Butter. Of the great variety of forms that have been given to the machine, it is very difficult to determine which deserves the preference. It is obvious that the more thorough and uniform the agitation, the more completely will the butter be separated from the milk. The consistency and colour of the butter are also elements in judging of the relative merits of churns. The temperature of the air and the milk affect the butter in these respects. During summer, that of the milk should not exceed 62°, and in very hot weather may be under 60°. During cold weather, the milk should be about 2° higher when put into the churn. The speed at which the operation is performed also influences the result. Trials instituted to test the relative merits of churns have failed to settle which is the best form for actual use in the dairy; for the same machine under different conditions does not always yield the same result. The oldest form is the upright or *plunge* churn. There is a general prejudice in favour of this form of C., on the ground that the butter is more completely separated and of better quality. Its great defect is that the operation, being generally performed by hand, is fatiguing. Recent improvements have chiefly aimed at ease in working, and a saving of time. The original *barrel* C., with a rotatory motion, like a grindstone, which motion was reversed every few rounds, has fallen from its once high repute into comparative neglect. An improvement on the barrel C. was the making of the barrel stationary, the milk being agitated by internal apparatus fixed on a horizontal spindle which is turned by a winch handle. Barrel churns, sometimes of monster size, are generally used in large dairies in Holland. For small or moderate-sized dairies, perhaps the most suitable is the *box* C., consisting of a cubical or oblong box, of birch or plane tree, having the agitators fixed on a horizontal spindle. Churns on a centrifugal action have also been successfully used, particularly in Sweden. More recently, churns of a barrel form, with an oscillating motion like a child's cradle, have been introduced, but without any decisively superior results.



Anthony's American Atmospheric Churn.

To all forms of churns, power other than manual can be, and is applied. In some parts of the continent of Europe, and in America, the dog is employed in churning by means of a contrivance like a squirrel's box. Horse-power is in very general use in large dairies in Great Britain. In very exceptional cases, steam-power is used.

**CHU'RRUS.** See Hemp.

**CHUSA'N**, an island on the east coast of China, 40 miles north-east from Ningpo, in 30° 40′ N. lat., and 121° 48′ E. long., of an oblong shape, and about 50 miles in circumference. It is mountainous; but has many fertile valleys, with a plentiful supply of water, and is very carefully cultivated by the hardy and independent people by whom it is inhabited. Mr Fortune was struck with the richness of its flora. Azaleas clothe the mountains; clematises, roses, and honeysuckles grow in great luxuriance. The camphor and tallow tree, and many varieties of bamboo, are found in the valleys. Tea is cultivated to some extent on the hill-sides. For three-fourths of the year, the climate is temperate. June, July, and August are the hot months. In August, the thermometer averages 83°, but in January and February it is often as low as 20°. Ting-hai, the capital, a walled town about two miles in circumference, containing a fine specimen of Buddhist temple-architecture, surrendered to the British forces, July 5, 1840, and was retaken by them (having been evacuated the previous February) October 1, 1841. At the close of the war, the island was delivered up to the Chinese. In 1860, it was again occupied by British troops, but, by the convention of Pekin, is to be evacuated.

**CHUSAN ISLANDS**, a group of islands scattered round the one described above. The most remarkable of these is the sacred island of Pu-tu, lying east from Chusan. It is covered with Buddhist temples, pagodas, and monasteries, which latter are inhabited by a great number of Bonzes, as the Chinese priests are called. The island is devoted exclusively to religious purposes, and no layman is allowed to reside upon it.

**CHU'TNEE**, or **CHU'TNY**, an East Indian condiment, very largely used in India and to a considerable and increasing extent in Great Britain. Indian C. is a compound of mangoes, chillies or capsicum (q. v.), and lime-juice, with some portion of other native fruits, such as tamarinds, &c., the flavour being heightened by garlic. It is sometimes manufactured for sale in England, but not in any quantity. Families occasionally make it for their own use, and employ the following ingredients: Chillies, 1—1½ lb.; apples, 1 lb.; red tamarinds, 2 lbs.; sugar-candy, 1 lb.; fresh ginger root, 1½ lb.; garlic, ½—¾ lb.; sultana raisins, 1½ lb.; fine salt, 1 lb.; distilled vinegar, 5 bottles. The chillies are to be soaked for an hour in the vinegar, and the whole ground with a stone and muller to a paste.

**CHYLE.** The food undergoes various changes in the alimentary canal, which will be fully noticed in the article on Digestion. One of these changes is its conversion in the stomach into a pulpy mass termed *chyme*. The chyme, which passes onward into the small intestine, is acted upon by the bile, pancreatic fluid, and intestinal juice, and through their influences is separated into the *chyle*, which is absorbed or sucked up by the lacteals (q. v.) and into matters unfit for nutrition, which ultimately find their way out of the system by the intestinal canal. The mode in which this nutritious C. is taken up by vessels distributed over the small intestines, and the changes which it undergoes before it is converted into true blood, are described in the articles LACTEALS, THORACIC DUCT, and NUTRITION. We shall here merely notice its leading physical and chemical properties. When obtained from the thoracic duct of an animal that has been killed while the process of digestion was going on (especially if it had taken fatty food), the C. is a white, milky-looking, or yellowish fluid, with a faintly alkaline reaction. Like the blood, it coagulates in about ten minutes after its abstraction from the body of the animal; and in about three hours a small but distinct gelatinous clot is separated from the serous fluid of the chyle.

On examining C. under the microscope, we find that it contains enormous numbers of minute molecules (probably consisting of fat), together with nucleated cells, which are termed the chyle-corpuscles, and are apparently identical with the white or colourless blood-cells. The chemical constituents of C. are much the same as those of blood; fibrin, albumen, fat, extractive matters, and salts being the most important.

**CHYLI'FEROUS SYSTEM.** See LACTEALS and THORACIC DUCT.

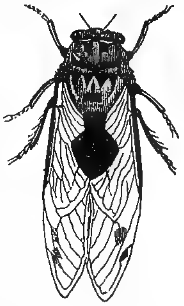
**CHYME.** See CHYLE and DIGESTION.

**CIBBER, COLLEY**, was born on the 6th November 1671, in London. He was sent to the free school at Grantham, in Lincolnshire, in 1682. Five years thereafter, he returned to London, and in 1688 was a volunteer in the forces raised by the Earl of Devonshire in support of the Prince of Orange. He afterwards conceived a passion for the stage, and after performing gratuitously for several months, he succeeded in obtaining an engagement at 10*s*. per week, which was raised to 15*s*.; and on the commendation of Congreve, who had witnessed his performance of Lord Touchwood, five additional shillings per week were added. Incited by this magnificent success, he, at the age of 22, married Miss Shore, to the great rage of her father, who revenged himself by spending the greater portion of his fortune in the erection of a retreat on the banks of the Thames. After marriage, C., discovering that 20*s*. per week was a somewhat insufficient income for an elegant gentleman and an elegant gentleman's wife, was induced to add thereto by the writing of comedies, some of which were remarkably successful. In 1711, he became one of the patentees in the management of Drury Lane, and remained in connection with that theatre till 1730; when, on being appointed poet-laureate, he sold his interest in the business. He was, however, sometimes tempted back to the stage by an offer of 50 guineas a night. During his life, C. wrote and adapted many plays. As an author, however, he is best known by his *Apology*, published in two volumes. He died suddenly on the 12th December 1757.

**CI'BOL.** See ONION.

**CIBRA'RIO, LUIGI**, an Italian historian and politician, was born at Turin, 23d February 1802. He studied at the university of that city, where he took his degree in 1824, as Doctor of Laws. Devoted to historical investigations, he secured a reputation in this important department, at a very early period. In 1825 appeared his *Notizie sulla Storia dei Principi di Savoia;* in 1826, his *Notizie di Paolo Simone de Belli;* and in 1827, his *Delle Storie di Chieri Libri IV.* King Charles Albert—with whom he was always a great favourite—frequently employed him in diplomatic service, and in 1848, when Italy rose against the Austrians, appointed C. extraordinary royal commissioner at Venice. During the same year, he was created a senator of the kingdom. When Charles Albert—after the unfortunate issue of the war—went to live in voluntary exile at Oporto, C. was sent by the Sardinian senate to induce him to return. He wrote an account of his unsuccessful mission, entitled *Ricordi d'una Missione in Portogallo al Re Carlo Alberto* (1850). During his public career, however, C. did not neglect his early and favourite pursuits. In 1839, he published his *Della Economia Politica del Medio Evo;* in 1840, his *Storia della Monarchia di Savoia;* in 1844, his *Storia e Descrizione della Badia d'Altacomba;* and in 1847, his *Storia di Torino.* But the new life and energy which Sardinia began to manifest under Victor Emmanuel had its claims on his public usefulness. In 1850 he was appointed Superintendent-general of Customs, and while occupying this office introduced several important reforms. Subsequently, he was intrusted with full powers to negotiate a treaty of commerce with France, in which he distinguished himself notably by his advocacy of the principles of free trade. In 1852 he was made Minister of Public Instruction, and, in 1855, Minister of Foreign Affairs. When Cavour took this department into his own hands, C. became first secretary of the king, an office which he still holds. In 1857, he was appointed president of the Telegraphic Congress of Turin. In 1860, C. again made his appearance as an author, in his *Operette Varie* (Torino), and his *Jacopo Valperga di Masino, Cancelliere di Savoya.* He is also about to commence a new work, entitled *I Servi della gleba.*

**CICA'DA**, a genus of insects of the order *Hemiptera*, sub-order *Homoptera*, remarkable for the sounds which they emit, the loudness of which is very extraordinary, when considered with reference to the size of the creatures producing them. The largest European species are only about an inch long. The elytræ, or wing-covers, of the cicadæ are almost always transparent and veined. They dwell on shrubs and trees, of which they suck the juices. The male insects alone possess the organs of sound perfectly developed. These are in noway connected with the mouth or throat, but may be described as a musical apparatus on the under side of the abdomen. This apparatus is very complicated, consisting of a set of membranes and fibres connected with powerful muscles. The sound can be produced even after the insect has been long dead, by pulling the fibres, and letting them escape. Cicadas are most common in tropical and warm temperate regions, and are scarcely known in Britain, although one or two species have been found in the south of England. The ancients regarded the sounds of these insects as types of music and eloquence. In some countries they bear names which signify that sleep is banished by their din. The sounds produced by some of the South American species, which are much larger than the European, are loud enough to be heard at the distance of [illegible] mile, and have been likened to the sound of a razor-grinder at work. The Greek name of the C. is *tettix*, often erroneously translated



Cicada.

grasshopper. These insects have indeed no resemblance to grasshoppers, and no power of leaping. C. is the Latin name. The modern Italian is *cicale*, the French *cigale*. Byron speaks of the 'shrill cicalas.'

CICATRISA'TION (Lat. *cicatrix*, a scar), the process of healing or skinning over of an ulcer or broken surface in the skin or in a mucous membrane, by which a fibrous material, of a dense resisting character, is substituted for the lost texture. The new tissue, in such a case, is called the cicatrix, and usually resembles, to a considerable extent, the structure which it replaces; it is, however, less elastic, and from its shrinking in volume, sometimes produces an appearance of puckering. The glands and other special structures of the original tissue are wanting in the cicatrix, which, however, performs perfectly well, in most instances, the office of protection to the parts below the surface. See INFLAMMATION and ULCERATION.

CI'CELY (*Myrrhis*), a genus of umbelliferous plants, nearly allied to Chervil, of which one species, SWEET C. (*M. odorata*), is common in the central and southern parts of Europe, and in similar climates in Asia, but in Britain is so generally found near human habitations, that it appears probably to have been introduced. It is sometimes called *Sweet Chervil*, and in Scotland *Myrrh*. It is a branching perennial, two feet high or upwards, with large triply pinnate leaves and pinnatifid leaflets, somewhat downy beneath; the fruit remarkable for its large size, and, as well as the whole plant, powerfully fragrant, the smell resembling that of anise. The seeds, roots, and young leaves are used in Germany and other countries in soups, &c. The plant was formerly much in use as a medicinal aromatic.

CI'CER. See CHICK PEA.

CI'CERO, MARCUS TULLIUS, the greatest orator of Rome, and one of the most illustrious of her statesmen and men of letters, was born at Arpinum, on the 3d of January, in the year 106 B.C. He belonged to an ancient family, of the equestrian order, and possessed of considerable influence in his native district. His father, himself a man of culture, and desirous that his son should acquire an eminent position in the state, removed him at an early age to Rome, where, under the direction of the orator Crassus, he was instructed in the language and literature of Greece, and in all the other branches of a polite education. In his sixteenth year he assumed the manly gown, and was introduced to the public life of a Roman citizen. He now acquired a knowledge of law, and underwent a complete course of discipline in oratory. At the same time, he studied philosophy under three successive preceptors, of the Epicurean, Academic, and Stoic schools, and neglected no mental exercise, however arduous, which might conduce to his future eminence; being thus early of the opinion which he afterwards maintained in his treatise *De Oratore*, that an orator should possess almost universal knowledge. With the exception of a brief campaign under Sulla, in the Social War, he passed his time in these preliminary studies until his 26th year, when he began to plead in public. In one of his earliest causes, he distinguished himself by defending the rights of Roscius, a private citizen, against one of the favourites of Sulla, who was then dictator. Soon after, for the benefit of his health, and in order to his improvement in elocution, he travelled to the chief seats of learning in Greece and Asia; and, on his return, was regarded as second to no orator at the Roman bar. Having been elected quæstor (76 B.C.), he was appointed by lot to a government in Sicily, a post which he filled with great ability, and to the entire satisfaction of those whom he governed. Some years after his return, he laid the Sicilians under still greater obligations by his successful prosecution of their prætor, Verres, against whom he prepared no less than six orations, although the first had the effect of disheartening the accused so effectually, that he voluntarily retired into exile. Passing, at short intervals, through the offices of ædile (69 B.C.) and prætor (66 B.C.), he was at length elected, by an overwhelming majority, to the consulship. His tenure of office was rendered memorable by the conspiracy of Catiline, which he frustrated with admirable skill and promptitude. See CATILINE. The highest praises were showered upon C.; he was hailed by Cato and Catulus as the 'Father of his Country;' and public thanksgivings in his name were voted to the gods. But his popularity did not last long after the expiry of his consulship. His enemies charged him with a public crime, in having put the conspiring nobles to death without a formal trial, and he found it necessary to leave Rome, and went to reside in Thessalonica (58 B.C.). A formal edict of banishment was pronounced against him, but he was recalled from exile in about 16 months, and on his return to Rome was received with great enthusiasm. His recovered dignity, however, soon excited the envy of the honourable party in the senate, with whom he had desired to make common cause; while Pompey and Cæsar, the greatest powers in the state, and from whose enmity he had most to dread, courted his alliance and co-operation. Thus, while preserving an appearance of independence, he was betrayed into many actions which he could not but regard as ignominious, and which, by increasing the power of the triumvirs, led indirectly to the ruin of the republic. A remarkable exception to this servile conduct is to be found in his assisting Milo when suing for the consulship, and defending him, against the wish of Pompey, and in spite of the hostile feeling of the populace, after he had slain Clodius in an accidental rencounter. During this period, he composed his works, *De Oratore*, *De Republica*, and *De Legibus*. After a year's admirable administration of the province of Cilicia (51—50 B.C.), he returned to Italy on the eve of the civil war. With the convictions which he avowed, there was but one course which it would have been honourable for him to pursue—to enlist himself, at all hazards, on the side of Pompey and the republic. But instead of this he hesitated, balanced the claims of duty and of interest, blamed Pompey for his want of preparation, and criticised the plan of his campaign. At length he joined the army of the senate, but, after the battle of Pharsalia, abruptly quitted his friends, and resolved to throw himself upon the generosity of the conqueror. After nine months' miserable suspense at Brundusium, he was kindly received by Cæsar, whom he followed to Rome. During the years which ensued, he remained in comparative retirement, composing his principal works in philosophy and rhetoric, including those entitled *Orator*, *Hortensius*, *De Finibus*, *Tusculanæ Disputationes*, *De Natura Deorum*, *De Senectute*, *De Amicitia*, and *De Officiis*. On the death of Cæsar, he was disposed to unite his interests with those of Brutus and the other conspirators, but was restrained by dictates of prudence. In the commotions which followed, he espoused the cause of Octavianus, and gave utterance to his celebrated philippics against Antony. These orations were the occasion of his death. When Octavianus and Lepidus joined with Antony in a triumvirate, C. was among the proscribed; and his life was relentlessly sought. The soldiers of Antony overtook him while his attendants were bearing him, now old, and in an infirm state of health, from his Formian villa to Caieta, where he intended to embark. He met his death with greater fortitude than he had supported many of the untoward incidents of his life. Desiring his attendants to forbear resistance, he stretched forward in the litter, and offered his neck to the sword of his executioners. He died in the 63d year of his age, on the 7th December, 43 B. C.

The character of C. is one which it is not difficult to estimate. Really a lover of virtue, no one could follow in her footsteps with greater dignity when attended by the popular applause. But he was weak enough to yield to the depraved spirit of his times, and to act according to his convictions only when they were not evidently discordant with his private interests. Few men, possessing such talents, have been so utterly devoid of anything approaching to heroism. As a statesman, it would be unjust to deny his legislative abilities; but he was generally deficient in courage and resolution. He was one of the greatest masters of rhetoric that have ever lived. His orations were the result of consummate art, combined with unwearied industry, and survive as characteristic memorials of a time when eloquence, far more than at present, was a power which bent the verdicts of judicial tribunals, and influenced the decrees of the state. In philosophy, he does not rank with the original thinkers of antiquity; nor, in truth, did he aspire to do so. His writings on speculative subjects are chiefly valuable on account of the noble and generous sentiments which they contain, and as reflecting the varied thought of the different schools. The best edition of his collected works is that of Orelli (9 vols. 8vo, 1826—1837).

**CICERO'NÉ** (from Cicero, the orator or speaker), a guide, usually for the purpose of shewing the curiosities and works of art in a town to strangers. Ciceronés are of all degrees, from distinguished archæologists, who undertake the office as a favour, to the humble *laquais de place*, who, though quite indispensable on a first arrival, is too often both incompetent and dishonest. The stranger ought to be particularly on his guard against allowing a C. to make purchases for or even with him, as the practice of adding a commission to him to the price charged now prevails probably in every country in Europe.

**CICHO'RIUM.** See CHICORY and ENDIVE.

**CICI'SBEO** is the name given in Italy to the professed gallant or constant attendant upon a married lady. In the higher ranks of Italian society, it was at one time considered unfashionable for the husband to associate with his wife anywhere except in his own house. In society, or at public places of amusement, the wife was accompanied by her C., who attended at her toilet to receive her commands for the day. This custom, which was once universal, and which naturally gave rise to much scandal, has now almost disappeared. C. is synonymous with *cavaliere servente*.

**CICO'NIA.** See STORK.

**CICU'TA.** See HEMLOCK.

**CID CAMPËADOR** is the name given in histories, traditions, and songs to the most celebrated of Spain's national heroes. There is so much of the mythical in the history of this personage, that hypercritical writers, such as Masdea, have doubted his existence; but recent researches, more particularly those of Dozy, and the investigation of newly discovered Arabic sources, have succeeded in separating the historical from the romantic. See Dozy's *Récherches sur l'Histoire Politique et Littéraire de l'Espagne pendant le moyen âge* (Leyden, 1849). The following is the result of these inquiries: Roderigo Ruy Diaz (Roderic the son of Diego) was descended from one of the proudest families of Castile. His name first appears in a document written in 1064, during the reign of Ferdinand of Leon. Under Sancho II., son of Ferdinand, he became standard-bearer and commander of the royal troops. In a war between the two brothers, Sancho II. and Alfonso VI. of Leon, it was a stratagem of Roderic's —which, according to modern notions, was anything but honourable—that secured the victory of Sancho at Llantada (1068) over his brother, who was forced to seek refuge with the Moorish king of Toledo. He appears at this time to have already been called the *Campeador*, a word supposed to answer to our champion.

Upon the assassination of his friend and patron, King Sancho, he required the next heir, Don Alonzo, to clear himself by oath of any participation in his brother's murder, ere the nobles of Leon and Castile should do homage to him. By this act, he incurred the new monarch's enmity; an enmity which, however, the king's policy concealed in the hour of danger, and he even consented to Roderic's marriage with his cousin Ximena—daughter of Diego, Duke of Asturia. But when the king thought the services of Roderic no longer necessary to his own safety, he lent a willing ear to the latter's personal enemies, and banished him in 1081. Roderic then joined the Moorish kings of Saragossa, in whose service he fought against both Moslems and Christians. It was probably during this exile that he was first called the Cid or Sîd, an Arabic title which means lord. He frequently defeated the king of Aragon and the Count of Barcelona, the latter of whom, Berenguer Ramon II., he took prisoner.

He was again reconciled to the king, but only for a short time, when he was condemned to a second exile. In order to support his family and numerous followers, he now saw himself forced to carry his sword against the Moors, over whom he gained a victory, and established himself as sovereign or lord of Valencia (1094). He retained possession of Valencia five years, during which time he took many neighbouring fortresses. He died of grief in 1099, on learning that his relative and comrade in arms, Alvar Fañez, had been vanquished by the Moors, and that the army which he had sent to his assistance had been defeated near Alcira. After the Cid's death, his widow held Valencia till 1102, when she was obliged to capitulate to the Almoravides, and fly to Castile, where she died in 1104. Her remains were placed by those of her lord in the monastery of San Pedro de Cadeña. The Cid had a son, who was slain by the Moors in a battle near Consuegra. He also left behind him two daughters, one of whom was married to the Count of Barcelona; the other to an Infant of Navarre, through whom the kings of Spain and many royal houses of Europe claim kindred with '*Mio Cid el Campeador*.' Relics of the 'Blessed Cid,' as he is still called in Spain, such as his sword, shield, banner, and drinking-cup, are still held in great reverence by the populace. The numerous *Cid romances* that were first published in the 16th c., contain the most romantic improbabilities concerning the life and deeds of the Cid. See *Silva de Varios Romances* (1550), and *Romancero General* (1604). These romances were taken from the ancient *cantares* (national songs) and *poemas*, most of which are entirely lost. The most important of modern works on this subject, besides that of Dozy above mentioned, are Huber's *Geschichte des Cid*, &c. (Bremen, 1829), and Southey's fascinating *Chronicle of the Cid* (Lond. 1808). The former of these is, however, the more valuable in a historical point of view.

**CI'DARIS**, a genus of *Echinidæ* (q. v.), or Sea-urchins, closely allied to the genus *Echinus* itself, and included along with it in a family or tribe called *Cidarites*, in which the mouth and anus are opposite to each other—the mouth below, and the anus above. Only one species, *C. papillata*, has been found in the British seas, and that only on the coasts of Zetland. The Zetlanders call it the *Piper*, from a resemblance which they trace in its globe and spines to a bagpipe. They say that it is sometimes found with spines a foot long. The markings of the shell and spines are extremely beautiful.

**CI'DER** is the fermented juice of apples, and is extensively prepared in Gloucestershire and other parts of England, in Ireland, in the northern districts of France, and in North America. In Normandy, a vast number of varieties of acid or bitter-apples are grown for the preparation of cider. The apples are first bruised in a circular stone-trough or *chase*, by a similarly shaped stone or *runner*, which revolves by machinery in the interior of the trough. The pulp so obtained is placed in sieve-bags made of haircloth or reed-straw, and subjected to pressure, which yields a dark-coloured, sweet liquid, and leaves in the bag a somewhat dry residue, consisting of the pips, skin, and other fibrous parts of the apple. The apple-juice passes first into a shallow tub or *trin*, and is almost immediately placed in casks in a cool place, when fermentation begins, part of the sugar is converted into alcohol, and in a few days, a clear liquid is obtained, which can easily be racked off from sedimentary matter. C. is largely used in England as a beverage, and is very palatable and refreshing. It contains from 5¼ to 9 per cent. of alcohol, and is therefore intoxicating when drunk in quantity. It does not possess the tonic and nourishing properties, however, of bitter-beer. C. quickly turns sour, becoming *hard* C., owing to the development of lactic acid, and great difficulty is experienced in the attempt to preserve it.

**CÏE'ZA**, a town of Spain, in the province of Murcia, 26 miles north-west of the city of that name. It is situated on an eminence near the river Segura, overlooking a plain of great fertility. The streets are tolerably wide and well paved; and there are manufactures of linen, hempen fabrics, wine and oil; and silkworms are reared. Pop. 6000.

**CIGA'RS.** See Tobacco.

**CI'GOLI**, Ludovico Cardi da, an eminent painter of the later Florentine school, which, about the end of the 16th c., developed, in opposition to the languid mannerists of the time, a peculiar *eclectic* style of art. C. was born at Empoli in 1559. His model was Correggio; but as the latter was deficient in design, and in a scientific knowledge of perspective, C. endeavoured to unite these with the warm bright colouring and wonderful chiaroscuro of Correggio. He was invited by Clement VII. to Rome, where he died in 1613. Among C.'s most famous pictures may be mentioned—'The Healing of the Lame Man' (St Peter's, Rome), 'The Martyrdom of St Stephen' (Uffizi Gallery, Florence), 'Tobias in the Act of Thanking the Angel' (St Petersburg), and 'St Francis,' a favourite subject with Cigoli (Pitti Palace, Florence). C. was also held in high estimation as an architect, and designed several of the Florentine palaces.

**CI'LIA** (Lat. eyelashes), a term variously employed in botany and zoology to designate fringing hairs or hair-like processes. Thus, the margins or nerves of leaves, petals, &c., are often described as *ciliated* or furnished with cilia. The fine thread-like processes which surround the opening of the fruit of many mosses, are called C.; but these processes, when broader, are denominated teeth.—The description and uses of C. in the animal kingdom are given in the article Epithelium.

**CILI'CIA**, an ancient division of Asia Minor, now included in the Turkish pashalic of Itshil. The Taurus range, which separated it from Cappadocia, bounded it on the N., the Gulf of Issus and the Cilician Sea on the S., while the Amanus and Pamphylia bounded it respectively on the E. and W. Lat. 36°—38° N., long. 32° 10′—37° 8′ E. The eastern portion of C. was fertile in grain, wine, &c.; while the western and more mountainous portion furnished inexhaustible supplies of timber to the ancients. The pass called by the Turks Gölek Bóghâz is that by which the younger Cyrus passed from Tyana in Cappadocia to Tarsus; and it is also the same by which Alexander the Great entered Cilicia.

In early ages, C. was ruled by its own kings, the dynasty of Syennesis being apparently the most important. The Cilicians were a distinct people in the time of Xenophon; but the Greeks appear to have got a footing after the time of Alexander. The Cilicians were notorious pirates, but having carried on their depredations too close to the shores of Italy, the Roman arms were turned against them, and C. was made a Roman province in Pompey's time.

**CIMABU'É**, Giovanni, one of the restorers of the art of painting in Italy, which had fallen into neglect during the barbarism of the dark ages, was born at Florence in 1240. At this time, the fine arts were practised in Italy chiefly by Byzantines, and had degenerated into a worn-out mechanical conventionalism. C. at first studied under Byzantine masters, and adopted their traditional forms, but gradually excelled his teachers, made innovations on the fixed patterns set before him, and gave life and individuality to his works. Two remarkable pictures of the Madonna by C. are still preserved in Florence—one (chiefly Byzantine in style) in the Academy; the other, displaying a more purely original genius, in the church of Santa Maria Novella. It is said that this latter work in the time of C. was admired as a miracle of art, and was carried to the church in a sort of triumphal procession. More remarkable pictures, in point of expression or dramatic effect, are found in C.'s frescoes in the church of San Francisco at Assisi. C. died soon after 1300. What strikes one as very wonderful about C.'s pictures, is the accuracy of his naked figures, considering that he had no better professional guides than the Byzantine artists. His draperies were also very good, but he had apparently no knowledge of perspective, though acquainted with architecture. His greatest pupil was Giotto (q. v.).

**CIMARO'SA**, Domenico, an Italian composer of operas, was born at Naples in 1755, and was educated in music under Sacchini, and in the conservatory of Loretto. His first pieces were the *Sacrificio di Abramo* and the *Olympiade*. When barely 22, he had achieved a reputation in all the leading Italian theatres. He was then called to St Petersburg, where he resided four years. Afterwards, he lived at various German courts; thence he proceeded to Vienna, where he became imperial chapel-master; and finally, he returned to Italy. At Naples, his comic opera, *Il Matrimonio Segreto*, composed at Vienna, 1791, was repeated 57 times in succession. C. died at Venice in 1801. His comic operas are remarkable for their novelty, spirit, whimsicality, and liveliness of idea, as well as for their great knowledge of stage-effect. The wealth and freshness of his invention gave rise to the saying, that one finale of C. contained material for a dozen operas.

**CI'MBALO**, a musical instrument with a set of keys like the clavecin or harpsichord.

**CI'MBRI**, or **KI'MBRI**, a people who issued from the north of Germany in conjunction with the Teutones, and first came into hostile contact with the Romans in the Eastern Alps in 113 B. C. They were victorious in several great engagements, and were only prevented from devastating Italy by sustaining a terrible defeat from Marius, on the Raudii Campi, near Verona, or, according to others, near Vercelli, in August, 101 B. C. Their infantry fought with their shields fastened together by long chains; their horsemen, of whom they had 15,000, were well armed with helmet, coat of mail, shield, and spear. Marius had so chosen his position that the sun and dust were in their faces, and yet they contested the victory most bravely with the Romans, who were 55,000 strong. When the battle was lost, the women, who remained in the camp formed of the wagons, killed themselves and their children. 140,000 C. are said to have fallen in the battle; the number of prisoners is given at 60,000. It is not till long afterwards, when the Romans themselves penetrated into Germany, that the name of the C. again appears. Cæsar represents the Aduatici of Belgium as the descendants of the C. and Teutones. Tacitus speaks of a people, bearing the name of C., few in number, but of great reputation, that sent ambassadors to Augustus. This people lived in the extreme north of Germany, on the borders of the ocean; according to Pliny and Ptolemy, at the extremity of the peninsula called from them the Cimbric Chersonese, now Jütland. The ethnology of the C. is doubtful. Greek writers associated them groundlessly with the Cimmerians (q. v.); Sallust calls them Gauls; Cæsar, Tacitus, and Plutarch looked upon them as Germans, and the opinion of their German origin has been adopted by most moderns. Yet H. Müller, in his *Marken des Vaterlands* (1837), has endeavoured to shew that they belonged to the Celtic race, and lived originally on the north-east of the Belgæ, of kindred origin; and that their name is the same as that by which the Celts of Wales designate themselves to this day—*Cymri.*

**CI'MEX AND CIMI'CIDÆ.** See BUG.

**CIMI'NNA**, a town of Sicily, in the province of Palermo, 18 miles south-east of the city of that name. Pop. 6150.

**CIMME'RIANS**, or **CIMME'RII**, in the poems of Homer, the name of the people dwelling 'beyond the ocean-stream,' where the sun never shines, and perpetual darkness reigns.—But the historic C. were a people whose country lay between the Borysthenes (Dnieper) and the Tanais (Don), including also the Tauric Chersonesus (Crimea). The Cimmerian Bosporus (Strait of Yenikale) derived its name from them. Being driven out by the Scythians, they migrated to Asia Minor, dwelt there for some time, plundered Sardis, failed in an attempt upon Miletum, and were finally routed and expelled by the Lydian king Alyattes, some time after 617 B. C.

**CI'MOLITE.** See FULLERS' EARTH.

**CI'MON**, an Athenian commander, was the son of Miltiades, the conqueror at Marathon. In conjunction with Aristides, he was placed over the Athenian contingent to the allied fleet, which, under the supreme command of the Spartan Pausanias, continued the war against the Persians (477 B. C.). He effected the important conquest of Eïon, a town on the river Strymon, then garrisoned by the Persians. Later (according to Clinton, 466 B. C.), when commander-in-chief, he encountered a Persian fleet of 350 ships at the river Eurymedon, destroyed or captured 200, and defeated the land-forces on the same day. He succeeded likewise in driving the Persians from Thrace, Caria, and Lycia; and expended much of the money which he had obtained by the recovery of his patrimony in Thrace upon the improvement of the city of Athens. At this period he appears to have been the most influential of the Athenians. The hereditary enemy of Persia, it was his policy to advocate a close alliance with Sparta; and when the Helots revolted, he led an army upon two occasions to the support of the Spartan troops; but on the latter occasion, having lost the confidence of his allies, he was ignominiously dismissed. After his return to Athens, his policy was opposed by the democracy, headed by Pericles, who procured his banishment by ostracism. He was recalled in the fifth year of his exile, and was instrumental in obtaining a five years' armistice between the Spartans and the Athenians. He died in the year 449 B. C., while besieging the Persian garrison of Citium, in Cyprus.

**CINCHO'NA**, a most important genus of trees of the natural order *Cinchonaceæ;* yielding the bark so much valued in medicine, known as Peruvian Bark, Jesuits' Bark, China Bark, Quina, Quinquina, Cinchona Bark, &c., and from which the important alkaloids *Quinia* or *Quinine* (q. v.), and *Cinchonia* or *Cinchonine*, are obtained. The species of this genus are sometimes trees of great magnitude; but an aftergrowth springing from their roots when they have been felled, they often appear only as large shrubs; and some of them in the highest mountain-regions in which they are found, are low trees with stems only eight or ten feet in height. They exist only in South America, between S. lat. 20° and N. lat. 10°, and chiefly on the eastern slope of the second range of the Cordilleras. All the Cinchonas are evergreen-trees; with laurel-like, entire, opposite leaves; stipules which soon fall off; and panicles of flowers, which, in general appearance, are not unlike those of lilac or privet. The flowers are white, rose-coloured, or purplish, and very fragrant. The calyx is small and 5-toothed; the corolla tubular with a salver-shaped 5-cleft limb. In the true *Cinchonas*, the capsule splits from the base upwards; the species in which it splits from above downwards form the sub-genus *Cascarilla;* the distinction acquiring importance from the consideration, that the barks of the former alone contain the alkaloids so valuable in medicine; and this property is further limited to those species which have the corolla downy or silky on the outside. Beyond the botanical limits thus narrowly marked out, not a trace of these alkaloids has yet been discovered anywhere.

Great difficulty has been found in determining the species by which the different varieties of C. bark known in commerce are produced. The common commercial names are derived partly from the colour of the kinds, and partly from the districts in which they are produced, or the ports where they are shipped. It appears, however, to be now ascertained that *Calisaya Bark*, also called Royal or Genuine Yellow Bark, one of the very best kinds—mostly shipped from Arica—is chiefly the produce of *C. Calisaya*, a large tree, growing in hot mountain valleys of Bolivia and the south of Peru. To give all the varieties of bark and species of tree would go beyond our limits.

The accurate discrimination of the different kinds of bark requires much experience. The taste is always bitter; but it is possible even to distinguish by the taste those varieties which contain quinia most largely from those in which cinchonia is most abundant.

The cutting and peeling of C.-trees are carried on by Indians, who go in parties, and pursue their occupation during the whole of the dry season. They build a hut, which serves both for their abode and for drying the bark. The trees are felled as near the root as possible, that none of the bark may be lost; and the bark being stripped off, is carefully dried; the quilled form of the thinner bark is acquired in drying. The bark is made up into packages of various size, but averaging about 150 lbs. weight, closely wrapped in woollen cloth, and afterwards in hides, to be conveyed on mules' backs to the towns. These packages are called drums or *seroons*. It is in them that the bark is always brought to Europe.

A number of spurious kinds of Peruvian or C. Bark are either sent into the market separately, or are employed for adulterating the genuine kinds. They are bitter-barks, and have, in greater or less degree, febrifugal properties, but are chemically and medicinally very different from true C. bark. They are produced by trees of genera very closely allied to cinchona.

It is much to be regretted, that whilst the C.-trees are becoming every year more scarce, and the demand for the bark is constantly increasing, no attempt is made to increase the supply by their cultivation. Nor does there appear any good reason why this, when it shall be attempted, should be limited to their native Cordilleras; it rather appears wonderful that earnest efforts have not been already made to diffuse plants so valuable over the many countries which would probably be found quite suitable to them in respect of climate.

The Indians of Peru call the C. trees *Kina*, from whence are derived the names *China*, *Quina*, &c. But it is not certain that they knew the use of the bark before the arrival of the Spaniards. It is a medicine of great value in the cure of intermittent fevers (see AGUE), and diseases attended with much febrile debility; also in certain forms of Neuralgia (q. v.), and other diseases of the nervous system. It seems to have been first imported into Europe in 1639, by the Countess Del Cinchon or Chinchon, the wife of the viceroy of Peru, who had been cured of an obstinate intermittent fever by means of it, and upon this account it was named *C. Bark* and *Countess's Powder* (*Pulvis comitissæ*). The Jesuit missionaries afterwards carried it to Rome, and distributed it through their several stations, and thus it acquired the name of *Jesuits' Bark* and *Powder of the Fathers* (*Pulvis patrum*). Cardinal Juan de Lugo having been particularly active in recommending and distributing it, it was also known as *Cardinal de Lugo's Powder*. It attained great celebrity in Spain and Italy, being sold at high prices by the Jesuits, by whom it was lauded as an infallible remedy, while by most of the orthodox physicians it was coldly received, and by the Protestants, altogther repudiated. Its mode of action not being well understood, and the cases to which it was applicable not well defined, it seems, in the first instance, to have been employed without due discrimination, and to have fallen very much into the hands of empirics. Falling, however, into disuse in Europe, it was again brought into notice by Sir Robert Talbor or Talbot, an Englishman, who brought it to England in 1671, and acquired great celebrity through the cure of intermittents by means of it, and from whom Louis XIV. purchased his secret in 1682. A pound of bark at that time cost 100 louis-d'or. Talbor seems to have been a vain and self-seeking man, but who had, nevertheless, the acuteness to discern and systematically to avail himself of the healing virtues of the neglected Jesuits' Bark, which he mixed with other substances, so as to conceal its taste and odour. Soon afterwards, both Morton and Sydenham, the most celebrated English physicians of the age, adopted the new remedy; and its use, from this period, gradually extended, both in England and France, notwithstanding the opposition of the Faculty of Medicine in the latter country. As it came into general use, it became a most important article of export from Peru; but for a long time, the value of the bark to be procured in New Granada remained unknown; and in order to the maintenance of a commercial monopoly, extraordinary methods were even employed to prevent it from becoming known at a comparatively recent period of Spanish rule in America. The discovery of the alkaloids on which its properties chiefly depend, constitutes a new era in the history of this medicine, and did not take place till the beginning of the present century.

The chief active principles are the two alkaloids, Quinine (q. v.) and Cinchonine. The latter is not generally present in so large a proportion as the quinine, and does not possess such powerful medicinal properties. When isolated, the alkaloid *Cinchonia*, or Cinchonine, has the formula ($C_{40}H_{24}N_2O_2$), and can be obtained in a crystallised state.

C. Bark itself has, in later times, fallen into comparative disuse, owing to the discovery of the alkaloid quinine, which is now extensively in use in medicine in the form of sulphate or disulphate of quina, and is given in doses of from one to twenty grains, in almost all the cases to which the bark was supposed to be applicable.

**CINCHONA'CEÆ**, a natural order of exogenous plants, consisting of trees, shrubs, and herbaceous plants, with simple, entire, opposite, or whorled leaves, and stipules between their footstalks. The calyx is adherent to the ovary; the corolla is tubular and regular, its segments are equal in number to those of the calyx, when the calyx is divided; the stamens arise from the corolla, and are alternate with its segments. The ovary is surrounded by a disk, and usually two-celled; the style single, the fruit either splitting into two halves or not splitting at all, either dry or succulent.—This order has been very generally regarded by botanists as a sub-order of *Rubiaceæ* (q. v.), but far exceeds all the rest of that order, both in the number and importance of its species, of which from 2500 to 3000 are known, mostly tropical, and the remainder, with few exceptions, sub-tropical. The C. are nearly allied to *Caprifoliaceæ* (woodbines or honeysuckles, &c.), and interesting relations have been pointed out between them and *Umbelliferæ*. They constitute a very large part of the flora of tropical regions. Besides the genus *Cinchona* (q. v.) and other genera producing febrifugal barks—*Exostemma*, *Condaminea*, *Pinckneya*, *Portlandia*, &c.—the order produces a number of valuable medicinal plants, of which Ipecacuanha (q. v.) is the most important. The Coffee (q. v.) shrub belongs to it; and also the tree which yields Gambir (q. v.). It produces a number of plants employed in dyeing, among which are the Chay Root or Choya, and some species of *Morinda*. Some trees of this order yield valuable timber. Many of the species have beautiful and fragrant flowers; and some produce pleasant fruits, among which are the Genipap (*Genipa Americana*) of South America, the Native Peach (*Sarcocephalus esculentus*) of Sierra Leone, and the Voavanga of Madagascar (*Vangueria edulis*).

**CINCINNA'TI**, the commercial capital of Ohio, is situated on the right bank of the river which gives name to the state, and separates it from Virginia and Kentucky. It stands in lat. 39° 6′ 30″ N., and in long. 84° 26′ W., 458 miles below Pittsburg, in Pennsylvania, where the Ohio, as such, is first formed, and 500 miles above the junction of that stream and the Mississippi. Though C. was founded in 1788, yet, in 1800, it had only 750 inhabitants. In 1820, 1830, 1840, and 1850, respectively, the national census gave it 9602, 24,830, 46,338, and 115,438. In 1853, a local enumeration resulted in 160,186; and, at a similar rate of increase, the population must now, in 1860, far exceed 200,000. Its natural facilities for commerce are great, and they have been increased artificially by the Miami Canal, which unites it with Lake Erie. In 1852, the water-borne commerce of this inland emporium employed 267 steam-vessels. In 1854, its shipping, enrolled and licensed, had an aggregate tonnage of 23,843 tons. Railways branch off from C., as a centre, in several directions. In 1854, the exports amounted to 45,432,780 dollars, and the imports to 65,730,029 dollars—being together equivalent to about £23,000,000 sterling.

The staple article of the trade of C. is pork. Lately, however, wine from the Catawba (q. v.) grape has been made in the neighbourhood, to a great extent. The city itself, also, is largely engaged in a variety of important manufactures, between 200 and 300 steam-engines being employed in the different establishments, and the aggregate products having, in 1851, been computed at 55,000,000 dollars. That computation referred in detail to iron-foundries, rolling-mills, lard-oil and stearine factories, and countless works connected with flour, clothing, furniture, paper, printing, tobacco, soap, candles, hats, &c. One remarkable fact, as bearing on the elements of the population, is, that of the thirty-five newspapers published in the city, eight —four daily and four weekly—are in German.

C. is substantially and handsomely built. Its ecclesiastical, literary, and commercial edifices are as numerous as befits the acknowledged Queen of the West. The city occupies chiefly two terraces, which are elevated respectively 50 feet and 108 above the level of the river. For the supply of the inhabitants, the water of the Ohio has been lifted into a limestone reservoir of 5,000,000 gallons, at an expense of 796,000 dollars, or about £160,000 sterling. The municipality, which is divided into 16 wards, is governed by a mayor and 48 trustees or councillors.

**CINCINNA′TI** (the Cincinnatuses), a society or order in the United States of North America, established by the officers of the revolutionary army in 1783, 'to perpetuate their friendship, and to raise a fund for relieving the widows and orphans of those who had fallen during the war.' It was so named because it included patriots, headed by Washington, who in many instances had left rural affairs to serve their country (see CINCINNATUS). The badge of the society is a bald eagle suspended by a dark-blue ribbon with white borders, symbolising the union of France and America. On the breast of the eagle there is a figure of Cincinnatus receiving the military ensigns from the senators, with the plough in the background; round the whole are the words, *Omnia reliquit servare rempublicam.* On the reverse, the same hero is represented crowned by Fame with a wreath on which is inscribed *virtutis præmium*, &c. As this distinction was made hereditary, it was attacked, as opposed to republican equality. Franklin saw in it the germ of a future aristocracy, and at a meeting held in Philadelphia in 1784, several changes were made in the constitution of the society, and in several of the states it was quietly abolished. There are still, however, several state societies, which hold a general meeting by delegates triennially.

**CINCINNA′TUS**, LUCIUS QUINCTIUS, a Roman consul, regarded by the later Romans as the model of antique virtue and simple manners. So far as we can discern his character through the veil of legend, C. appears to have been a violent patrician. About 460 B. C., he was chosen consul, and two years later, was made dictator. When the messengers from Rome came to tell C. of his new dignity, they found him ploughing on his small farm. He soon rescued the consul Lucius Minucius, who had been defeated and surrounded by the Æqui. Livy's account of the mode in which the deliverance was effected is rejected by Niebuhr, who points out the inconsistencies and impossibilities of the story, and seems disposed to regard the whole as a mere myth. We are next informed that, after a dictatorship of sixteen days, C. returned to his small farm on the Tiber. When 80 years old, he was once more made dictator (439 B. C.), and suppressed a threatened plebeian insurrection.

**CI′NDER-BED**, a name given by the quarrymen to a stratum of the Upper Purbeck series, almost entirely composed of the loosely aggregated shells of a small oyster (*Ostrea distorta*).

**CINERA′RIA**, a genus of plants of the natural order *Compositæ*, sub-order *Corymbiferæ*, very nearly allied to *Senecio* (Groundsel, Ragwort, &c.), from which it differs only in having the involucre formed of one row of equal erect scales. The species are numerous, and widely diffused over the world in very various climates. They are annual or perennial herbaceous plants; with simple, generally toothed or sinuate leaves. Many of them are remarkable for the ashy appearance of the lower part of the leaves, whence their name (Lat. *cinis*, *-eris*, ashes). The leaves are often covered with a peculiar sort of down. Two small species are natives of the southern parts of Britain. The flowers of some are very pretty. *C. maritima*, a native of the south of Europe, and other species, have for some time been much cultivated in gardens and green-houses. Many hybrids and varieties have been produced by cultivation.

**CI′NERARY URNS** (Lat. *cinis*, ashes) were used by the nations of antiquity to contain the ashes of the dead when gathered from the funeral pile. Previous to being deposited in the urn, the embers were soaked with wine; the urn was then placed in a niche in the family mausoleum. Only the wealthy could afford so expensive a rite. C. U. were either sculptured in marble, or formed of clay or glass. They were not always in the form in which we commonly see them represented on modern tombs. Fig. 1 of the accompanying illustrations is the

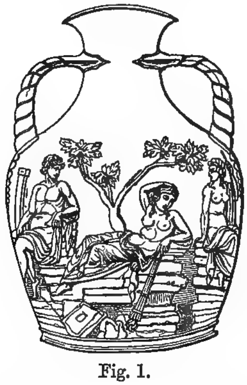


Fig. 1.

celebrated cinerary urn known by the name of the Portland or Barberini vase, preserved in the British Museum. This beautiful production of Greek art was discovered about the middle of the 16th c., in a marble sarcophagus in a sepulchre (believed to be that of the Roman emperor Alexander Severus, 223—235 A. D.) at Monte del Grano, near Rome. The height of the urn is 10 inches. Fig. 2 is one of the finest specimens yet discovered in the British Isles, and is preserved in the museum of the Royal Irish Academy. It was found in a small stone chamber near Bagnalstown, county of Carlow. It is composed of very fine clay, and is but $2\frac{1}{8}$ inches high. It contained the burnt bones of an infant or very young child.

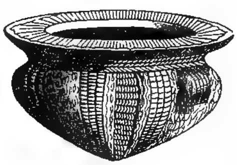
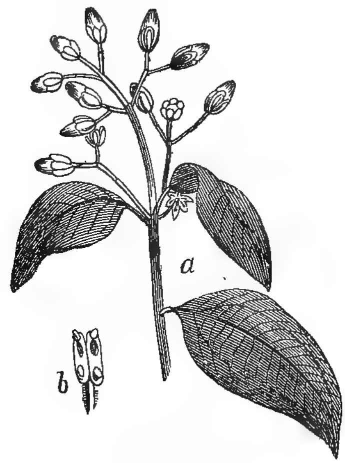


Fig. 2.

**CI'NNA**, Lucius Cornelius, a Roman noble, was one of the principal supporters of the faction of Marius. After Sulla had driven Marius from the city, and before setting out on his expedition against Mithridates, he allowed C. to be elected to the consulship. But C. had no sooner entered upon that office (87 B.C.), than he impeached Sulla, endeavoured to form an interest among the citizens who had been added to Rome after the Social War, and agitated for the recall of Marius. The events which led to the return of Marius are stated in the article Marius (q. v.). After a cruel massacre of the Roman citizens, in which some of the most eminent statesmen and orators were slain, Marius and C. declared themselves consuls. On the death of Marius, which occurred within a few days of his usurpation, C. made L. V. Flaccus his colleague for that year, and C. P. Carbo for the two succeeding years. In 84 B.C., he prepared to meet Sulla, who was then on his way from the East to take vengeance upon his enemies, but was slain by his disaffected troops at Brundusium. During his fourth consulate, his daughter Cornelia had been married to Julius Cæsar.

**CI'NNABAR**, an ore of mercury, from which almost all the mercury of commerce is obtained. Chemically, it is a bisulphuret of mercury, containing 86·2 parts of mercury and 13·8 of sulphur. It occurs both crystallised and massive, not unfrequently disseminated. Its crystals are six-sided prisms. It varies from perfectly opaque to almost transparent; has an adamantine almost metallic lustre, and a carmine colour, with a bright scarlet streak. Its specific gravity is 8—8·2. *Hepatic C.*, so called from its liver-brown colour, is a variety containing a little carbon. C. sometimes occurs in primitive rocks, but more frequently in those of the coal formation, and is sometimes even intimately mixed with coal itself. It is, however, a rare mineral, and is nowhere found in Britain. The C. mines of Almaden, in Spain, have been worked for about 2300 years, and are still the most productive in the world. At Almaden, the C. is found in a dark-coloured slate mixed with quartzite. Next to the mines of Almaden, rank those of Idria in Carniola. C. mines exist also in Germany, Hungary, Peru, California, China, Japan, &c. C. is used as a pigment under the name of *Vermilion.*

**CI'NNAMON** is the spicy, aromatic, and stimulating bark of certain species of the genus *Cinnamomum.* This genus belongs to the natural order *Lauraceæ*, and was formerly included in *Laurus.* It contains a considerable number of species, natives of tropical and subtropical parts of the East. C. has been in use from the remotest antiquity. It is mentioned in the Old Testament, and by a name almost the same as that which it still bears in most languages. The finest kind is said to be chiefly produced by *Cinnamomum Zeylanicum* (formerly, *Laurus Cinnamomum*), which chiefly grows in the island of Ceylon, although, having been introduced into the West Indies in 1782, along with various other plants of the East, it is now cultivated there to some extent. The tree attains the height of 20—30 feet, and is sometimes $1\frac{1}{2}$ foot in thickness. Its bark is of a grayish-brown colour, internally of a yellowish red. The leaves are oval, 4—6 inches long, with a blunt point, and marked with three principal nerves. They have the taste of cloves. The flowers are of a silky gray on the outside, and a pale-yellowish colour internally. The fruit is somewhat like an acorn in shape; it is a small drupe, brown when ripe. There are two seasons of cinnamon-harvest in Ceylon, the first commencing in April, and the last in November—the former being that in which the chief crop is obtained. The branches of 3—5 years' growth being cut down, the epidermis is scraped away; the bark is then ripped up longitudinally with a knife, and gradually loosened, till it can be taken off. The slices are then exposed to the sun, when, as it dries, it curls up into *quills*, the smaller of which are inserted into the larger, and the whole tied up in bundles of about 88 lbs. each. C. is examined and arranged according to its quality by persons who are obliged for this purpose to taste and chew it, although in a short time it produces painful effects on their mouths and tongues. The finest C. is yielded by the young branches of the tree, especially by the numerous shoots which spring up from the stump after a tree has been cut down, and which are cut when about 10 feet long, and of the thickness of an ordinary walking-stick. The smell, particularly of the thinnest pieces, is delightfully fragrant, and the taste pungent and aromatic, with a mixture of sweetness and astringency. It is used like other spices by cooks and confectioners, and also in medicine as a tonic, stomachic, and carminative. The average quantity annually imported into London is about 500,000 lbs. Its virtues depend chiefly upon the essential oil which it contains (*Oil of Cinnamon*). Oil of cassia is very often substituted for this oil, as cassia —which, however, may readily be distinguished



Cinnamon:
*a*, end of branch, with leaves and flowers; *b*, four-celled anther.

by its mucilaginous taste—is for cinnamon. The root of the C.-tree contains camphor. The fruit yields a concrete oil, called *Cinnamon Suet*, which is highly fragrant, and in Ceylon was formerly made into candles, for the exclusive use of the king.—Cassia (q. v.) is the produce of another species of *Cinnamomum.*—*C. Loureirii*, a native of Cochin China and Japan, is said to yield a bark even superior to that of *C. Zeylanicum.* A species of C., which ascends to the elevation of 8500 feet in the Sikkim Himalaya, deserves a trial even in the climate of Britain.

The constituents of C. are a volatile oil (*Oil of C.*), tannin, starch, mucilage, woody-fibre, resin, colouring matter, and an acid. The oil of C. is generally prepared in Ceylon by grinding the coarsest pieces of C., soaking them in sea-water for two or three days, and then distilling. Two oils pass over, one lighter, the other heavier than water. Oil of C. varies in colour from yellow to cherry-red, the yellow variety being considered the best, and is most highly esteemed. *Oil of C. leaf* is prepared from the leaves in Ceylon by a similar process, and is met with in commerce under the name of *clove oil*, which it much resembles in odour. *C. water* is obtained by adding water to C., and distilling a large quantity, or by diffusing the *oil of C.* through water by the aid of sugar or carbonate of magnesia. *Spirit of C.* is procured by acting upon C. with spirit of wine and water, and distilling; and *tincture of C.*, by soaking C. in spirit of wine, and straining. The medicinal properties of C., and its preparation, are aromatic and carminative, and it is serviceable in cases of nausea and vomiting, and in cases of flatulence and spasmodic states of the stomach and alimentary canal.

**CI'NNAMON-STONE**, a precious stone, of which the finer specimens are highly esteemed; it is regarded as a variety of Garnet (q. v.). Its colour varies from hyacinth red to orange yellow; and when pure, it is transparent. It is composed essentially of silica, alumina, and lime. It is found chiefly in Ceylon, where vast boulders of gneiss containing it in profusion exist in many places.

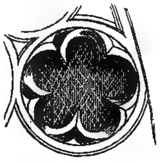
**CI'NNYRIS.** See Sun-bird.

**CI'NQUÉ CE'NTO** (Ital.), five hundred. A technical, or rather *slang* artistic term, used to designate the style of art which arose in Italy after the year 1500, and which therefore belongs to the 16th c.; i.e., after the fall of all the great schools. It is sensuous in its character, the subjects chosen being usually borrowed from heathen mythology or history.

**CI'NQUEFOIL**, in Botany. See Potentilla.

**CINQUEFOIL**, a common bearing in heraldry. It is usually depicted with the leaves issuing from a ball as a centre point.—C., in architecture, is an ornamental foliation in five compartments, used in the tracery of windows, panellings, and the like. The C. is often represented in a circular form, the spaces between points or cusps representing the five leaves, as in the accompanying illustration.

Cinquefoil:
In Heraldry.



Cinquefoil:
In Architecture.

The C. of heraldry and of architecture is not derived from any leaf of five leaflets, but, as its perfect regularity of form indicates, from the flower of the plant called C. (*Potentilla*), or other similar flower of five petals or *leaves.* The C. thus closely resembles the rose, with which it would, indeed, be identified, but that a double and not a single rose is chosen for the purposes of heraldry and decorative art.

**CINQUE PORTS** (Fr. five ports). It is said that the five maritime ports of England lying opposite to the coast of France—Sandwich, Dover, Hythe, Romney, and Hastings—were enfranchised in the time of Edward the Confessor. But it was subsequent to the battle of Hastings that the Conqueror, in order that he might wield the resources of the seaports with greater vigour, constituted this whole line of coast into a jurisdiction entirely separate from the counties of Kent and Sussex, and erected it into a sort of county palatine, under a warden or guardian, the seat of whose administration was in Dover Castle. The warden, whose office corresponded to that of the ancient count of the Saxon coast (*Comes littoris Saxonici*), exercised jurisdiction, civil, military, and naval, uniting in his single person the functions of sheriff, custos rotulorum, lord-lieutenant, and admiral. Privileges equal to those originally bestowed on the C. P. were subsequently extended to the so-called *ancient towns* of Winchelsea and Rye; and most of the municipal towns had subordinate ports and towns attached to them, which were called *members.* In place of the Saxon terms of *aldermen* and *freemen*, those of *jurats* and *barons* were introduced, and the latter term has always been applied to the representatives of the C. P. in parliament. The chief function performed by the C. P. in early times consisted in furnishing such shipping as was required for the purposes of the state, the crown having possessed no permanent navy previous to the reign of Henry VII. In the time of Edward I., they were bound to provide no less than 57 ships, fully equipped and manned at their own cost; though the weight of this heavy burden was somewhat lessened by the provision, that the period of gratuitous service should be limited to 15 days. In consequence of the warlike navy which they were thus compelled to maintain, the C. P. became so confident in their strength, and so insolent and audacious as not only to undertake piratical expeditions, but even to make war and form confederacies as independent states. Previous to the Revolution of 1688, the lord-wardens were in use to nominate the barons, or parliamentary representatives of the C. P.; but in 1689, an act was passed to 'declare the right and freedom of election of members to serve in parliament for the cinque ports.' The Reform Bill of 1832 reduced the number of members sent to parliament by the C. P. from 16 to 8, and the Municipal Reform Act has broken up the ancient organisation of the ports, and assimilated their internal arrangements to those of other English municipalities. The ancient courts of Stepway, Brotherhood, and Guestling are still occasionally held, but their powers scarcely extend beyond matters of form, such as appointing the barons, who are to exercise an ancient privilege of the ports, which consists in carrying the canopy over the sovereign's head at a coronation. The lord-warden's jurisdiction, in relation to civil suits and proceedings, was abolished by 18 and 19 Vict. c. 48, amended by 20 and 21 Vict. c. 1.

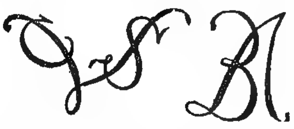
**CI'NTRA**, a small but picturesquely situated town in Portugal, in the province of Estremadura, about 15 miles west-north-west of Lisbon, with a population of 4300. It stands on the declivity of the

Sierra de Cintra, and is surrounded by country residences. There is a palace at C., a strange mixture of Moorish and Christian architecture, anciently occupied by the Moorish kings, and subsequently a favourite residence of the Christian monarchs. A charming view of the town and of the sea is to be had from the top of a hill crowned with the ruins of a Moorish castle. On another hill-top stands La Penna, once a convent, now a residence of the king of Portugal, who has restored and given it the outward appearance of a feudal castle. In the neighbourhood, also, is what is called the Cork Convent, which derives its name from the cells—which are cut out in the rock—being lined with cork to prevent damp.

C. is historically remarkable for the *Convention* concluded here, August 22, 1808, between the English and French, by which the latter agreed to evacuate Portugal. Junot had been defeated by Sir Arthur Wellesley at Vimieira, and had retreated towards Torres Vedras and Lisbon, whither the English under Sir Hew Dalrymple, who had just arrived and assumed the chief command, were preparing to follow them. But the French, despairing of finally holding out, agreed to evacuate the country, on condition of not being treated as prisoners of war, but landed on the coast of France, retaining their arms and effects. This convention excited the greatest public indignation both in the Peninsula and in England. Several English newspapers appeared in mourning, and the ministry were obliged to have the generals who signed the convention tried by a court-martial, which, however, resulted in their acquittal. In fact, though the terms of the convention might be advantageous for the French, to obtain immediate possession of Portugal and Lisbon, instead of being put to the necessity of a bloody siege for months, was no less advantageous to the English and their allies. Such, at least, was the opinion of two competent judges—Napoleon and Wellington.

**CIOTAT**, La, a town of France, in the department of Bouches-du-Rhone, situated on the west side of a bay in the Mediterranean, about 15 miles south-east of Marseille, in the midst of a district clad with olive, orange, and pomegranate plantations. It is well built, and has a good and commodious harbour, formed by a mole, and well defended. The industry consists in cotton-spinning, ship-building, and an active trade in the produce of the district. Pop. 5730.

**CI'PHER**, an ornamental arrangement of the initial letters of a name, by which they become also a private mark, adopted by artists and architects as distinctive of their work. That of Albrecht Dürer is well known. Of those given in the illustration, the first is that of Christopher von Sichem; the second, that of Adrian Bolswert.



Ciphers.

**CI'PHER-WRITING.** See Cryptography.

**CIPRIA'NI**, Giambattista, painter and copper-engraver, was born in Florence, 1732, or, according to others, in 1727, and when 19 years old, went to Rome, where he chose Correggio as a model, and soon gained a high reputation. Invited by certain English residents in Rome, the artist came to London about 1754, where he was one of the first members of the Royal Academy (founded 1769), and died in 1785. His drawing is correct, his colouring harmonious, his heads have grace and loveliness, and the general style of his works is attractive, although exceedingly conventional. A series of small copperplate illustrations of *Orlando Furioso* well exemplifies his graceful style. Several of Bartolozzi's best engravings are in C.'s manner.

**CIRCÆ'A** (from *Circe*, q. v.), a genus of rather pretty little herbaceous plants of the natural order *Onagraceæ*, with a deeply 2-cleft calyx, a corolla of two petals, and two stamens. *C. Lutetiana* is frequent in shady situations in Britain, and in most parts of the continent of Europe. It bears the English name of Enchanter's Nightshade, and in Germany it is called Hexenkraut (Witches' Herb). The origin of such names is not easily explained. The plant possesses no remarkable properties, being merely a little astringent. Other species are found in the Himalaya, &c.

**CIRCARS.** See Northern Circars.

**CIRCASSIA**, a division of the Western Caucasus, comprising the north, and also a portion of the south slope of that mountain-range extending in lat. 42°—45° N., and long 37°—47° E. See Caucasus.

**CIRCASSIANS**, in the wide sense of the term, is the name given to all the independent tribes of the Caucasus; in a narrower sense, it denotes the inhabitants of the western part of the range, which is called, in consequence, Circassia. The C. proper, however, inhabit only the north-western wing of the Caucasus, with the exclusion of Abasia, or the portion between the Black Sea in the west and the lower bank of the river Kuban in the north. They are called by the Turks *Tcharcassians*, but by themselves Adighê. They number from 500,000 to 600,000, and are divided into fifteen tribes or clans. For their place in Ethnology, see Caucasian Variety of Mankind. The Circassian language, as regards the pronunciation, is peculiar, and difficult to acquire. The social condition of these tribes is precisely what it was when they first appear in history. They are a marauding and warlike people, amongst whom it is held more honourable to live by plunder than by peaceful industry. In common with all brigand tribes, the C. cherish the most unrestrained love of independence. Their government is a singular compound of constitutionalism and feudalism. There are five distinct ranks in the nation—viz., chiefs or princes, nobles, common freemen, dependants, and slaves. The class of common freemen make up the great mass of the people; they possess property, and enjoy the same political rights as the nobles. The fourth class, the dependants, are the vassals of the princes and nobles, whose lands they cultivate, and whose armies they form. Yet their lord has no right over their person; for in some cases they and their whole families leave him; and they can only be sold as slaves for punishment according to the previous verdict of a national assembly. The fifth class comprises the slaves, or those who have been made captive in war. They constitute the greater part of the wealth of their lords, and serve especially to increase their power.

As regards the religion of the C., the princes and nobles are principally Mohammedans, whilst the great mass of the people have a religion which is a kind of mixture of Christianity and paganism, in which the celebration of Easter, the sign of the Cross, sacred trees, sacrifice and processions with lights, play an important part. The C. are as yet ignorant of writing, although they possess minstrels (*kikoakoa*), who are held in great esteem. Besides agriculture and the rearing of cattle, which is carried on by the dependants, slaves, and women, they possess a few other branches of industry sufficient to satisfy their commonest wants. The C. are proverbially handsome; they are also strong, active, and temperate, and are characterised by the higher attributes of self-dependence, courage, and prudence. The C. make their first historical appearance during the middle ages. They are, however, chiefly known through their long struggles to maintain their independence against the aggression of Russia. See CAUCASUS.

**CI'RCÉ**, a fabulous sorceress, is described by Homer as 'fair-haired, a clever goddess, possessing human speech,' sister of 'all-wise Æætes,' daughter of 'the Sun, who gives light to mortals, and of Perse, whom Ocean begot as his daughter.' Round her palace in Ææa were numbers of human beings, whom she had changed into the shapes of wolves and lions by her drugs and incantations. She changed two-and-twenty of the companions of Ulysses into swine; but that hero, having obtained from Mercury the herb *Moly*, went boldly to the palace of the sorceress, remained uninjured by her drugs, and induced her to disenchant his comrades. He remained with her for a year; and when he departed, she instructed him how to avoid the dangers which he would encounter on his homeward voyage (*Odyssey*, Books x. and xii.). Jealous of Scylla, whose love was sought by Glaucus, she poured the juice of poisonous herbs into that part of the sea where her rival was accustomed to bathe, and changed her into a hideous monster (*Metamorphoses*, Book xiv., fables 1 and 6).

**CI'RCLE**, a plane figure bounded by a curved line, which returns into itself, called its *circumference*, and which is everywhere equally distant from a point within it called the *centre* of the circle. The circumference is sometimes itself called the C., but this is improper; C. is truly the name given to the space contained within the circumference. Any line drawn through the centre, and terminated by the circumference, is a *diameter*. It is obvious that every diameter is bisected in the centre. (See ARC, CHORD.) In Co-ordinate Geometry, the C. ranks as a curve of the second order, and belongs to the class of the conic sections. It is got from the right cone by cutting the cone by a plane perpendicular to its axis. The C. may be described mechanically with a pair of compasses, fixing one foot in the centre, and turning the other round to trace out the circumference. The C. and straight line are the two elements of plane geometry, and those constructions only are regarded as being properly geometrical which can be effected by their means. As an element in plane geometry, its properties are well known and investigated in all the text-books. Only a few of the leading properties will here be stated.

1. Of all plane figures, the C. has the greatest area within the same perimeter.

2. The circumference of a C. bears a certain constant ratio to its diameter. This constant ratio, which mathematicians usually denote by the Greek letter $\pi$, has been determined to be 3·14159, nearly, so that, if the diameter of a C. is 1 foot, its circumference is 3·14159 feet; if the diameter is 5 feet, the circumference is $5 \times 3{\cdot}14159$; and, in general, if the diameter is expressed by $2r$ (twice the radius), then $c$ (circumference) $= 2r \times \pi$. Archimedes, in his book *De Dimensione Circuli*, first gave a near value to the ratio between the circumference and the diameter, being that of 7 to 22. Various closer approximations in large numbers were afterwards made, as, for instance, the ratio of 1815 to 5702. Vieta, in 1579, shewed that if the diameter of a C. be 1000, &c., then the circumference will be greater than 3141·5926535, and less than 3141·5926537. This approximation he made through ascertaining the perimeters of the inscribed and circumscribed polygons of 393,216 sides. By increasing the number of the sides of the polygons, their perimeters are brought more and more nearly into coincidence with the circumference of the circle. The approximation to the value of $\pi$ has since been carried (by M. de Lagny) to 128 places of figures. It is now settled that $\pi$ belongs to the class of quantities called *Incommensurable* (q. v.), i. e., it cannot be expressed by the ratio of any two whole numbers, however great. In general, it may be considered that 3·14159 is a sufficiently accurate value of $\pi$.

Though the value of $\pi$ was at first approached by actually calculating the perimeter of a polygon of a great number of sides, this operose method was long ago superseded by modes of calculation of a more refined character, which, however, cannot here be explained. Suffice it to say that various series were formed expressing its value; by taking more and more of the terms of which into account, a closer and closer approach to the value might be obtained. We subjoin one or two of the more curious.

$$\pi = 4\left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \text{\&c.}\right).$$

$$\pi = 8\left(\frac{1}{1\cdot3} + \frac{1}{3\cdot5} - \frac{1}{3\cdot5\cdot7} + \frac{1}{5\cdot7\cdot9} - \frac{1}{7\cdot9\cdot11} + \frac{1}{9\cdot11\cdot13} - \text{\&c.}\right).$$

3. The area of a C. is equal to $\pi$ multiplied by the square of the radius ($= \pi r^2$); or to the square of the diameter multiplied by $\frac{\pi}{4}$; i. e., by ·7854. Euclid has proved this by shewing that the area is equal to that of a triangle whose base is the circumference, and perpendicular height the radius of the circle.

4. It follows that different circles are to one another as the squares of their radii or diameters, and that their circumferences are as the radii or diameters.

The C. is almost always employed to measure angles, from its obvious convenience for the purpose, which depends on the fact demonstrated in Euclid (Book iv. Prop. 33), that angles at the centre of a C. are proportional to the arcs on which they stand. It follows from this, that if circles of the same radii be described from the vertices of angles as centres, the arcs intercepted between the lines, including the angles, are always proportional to the angles. The C. thus presents us with the means of comparing angles. It is first necessary, however, to graduate the C. itself; for this purpose, its circumference is divided into four equal parts, called *quadrants*, each of which obviously subtends a right angle at the centre, and then each quadrant is divided into degrees, and each degree into minutes, and so on. The systems of graduation adopted are various, and will now be explained.

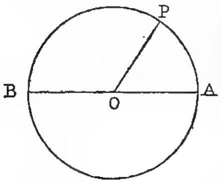
*The sexagesimal scale* is that in common use. According to it, each quadrant or right angle being divided into 90 *degrees*, each degree is divided into 60 seconds, and each second into 60 thirds, and so on. According to this scale, 90° represents a right angle; 180°, two right angles, or a semicircle; and 360°, four right angles, or the whole circumference—the unit in the scale being the $\frac{1}{90}$th of a right angle. As the divisions of the angles at the centre, effected by drawing lines from the centre to the different points of graduation of the circumference, are obviously independent of the magnitude of the radius, and therefore of the circumference, these divisions of the circumference of the C. may be spoken of as being actually divisions of angles. By laying a graduated C. over an angle, and noticing the number of degrees, &c., lying on the circumference between the lines including the angle, we at once know the magnitude of the angle. Suppose the lines to include between them 3 degrees, 45 minutes, 17 seconds, the angle in this scale would be written 3° 45′ 17″.

It is obvious, however, that the division of the quadrant into 90 degrees instead of any other number, is quite arbitrary. We may measure angles by the C., however we graduate it. Many French writers, accordingly, have adopted the

*Centesimal Division of the Circle.*—In this division, the right angle is divided into 100 degrees, while each degree is divided into one hundred parts, and so on. This is a most convenient division, as it requires no new notation to denote the different parts. Such a quantity as 3° 45′ 17″ is expressed in this notation by 3·4517, the only mark required being the decimal point to separate the degrees from the parts. Of course, in this illustration, 3° means 3 centesimal divisions of the right angle, and 45′ means 45 centesimal minutes, and so on. If we want to translate the quantity 3° of the common notation into the centesimal notation, we must multiply 3 by 100, and divide by 90. To translate minutes in the common notation into the centesimal, the rule is to multiply by 100, and divide by 54.

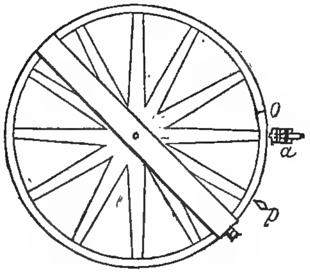
There remains yet another mode of measuring angles, known as the

*Circular Measure.*—The circular measure of angles is in frequent use, and depends directly on the proposition (Euc. vi. 33), that angles at the centre of a C. are proportional to the arcs on which they stand. Let POA be an angle at the centre O of a C., the radius of which is $r$; APB a semicircle whose circumference accordingly $= \pi r$; and let the length of the arc AP $= a$. Then, by Euclid, $\frac{\text{angle POA}}{\text{2 right angles}} = \frac{a}{\pi r}$; and $\angle\text{POA} = \frac{\text{2 right} \angle\text{s}}{\pi} \cdot \frac{a}{r}$. Now, supposing $a$ and $r$ to be given, although the angle POA will be determined, yet its numerical value will not be settled unless we make some convention as to what angle we shall call unity. We are free to make any convention we please, and therefore choose such a one as will render the preceding equation the most simple. It is made most simple if we take $\frac{\text{2 right angles}}{\pi} = 1$. We shall then have (denoting the numerical value of the angle POA by $\theta$) $\theta = \frac{a}{r}$. The result of our convention is, that the numerical value of two right angles is $\pi$, instead of 180°, as in the method of angular measurement first alluded to; and the unit of angle, instead of being the ninetieth part of a right angle, is $\frac{\text{2 right angles}}{\pi}$, or 57° 17′ 44″ 48‴ nearly. Making $\theta = 1$ in the equation $\theta = \frac{a}{r}$, we have $a$ (or AP) $=$ $r$ (or AO), which shews that in the circular measure, the unit of angle is that angle which is subtended by an arc of length equal to radius. It is frequently a matter of indifference which mode of measuring angles is adopted; the circular measure, however, is generally the most advantageous, as being the briefest. It is easy to pass from this mode of measurement to the sexagesimal. If $\theta$ be the circular measure of an angle, the angle contains $\frac{\theta}{\pi} \cdot 180$ degrees; conversely, if an angle contain $n°$, its circular measure is $\frac{n}{180} \cdot \pi$.



**CIRCLE, Magic**, a space in which sorcerers were wont, according to the ancient popular belief, to protect themselves from the fury of the evil spirits they had raised. This C. was usually formed on a piece of ground about nine feet square (in the East, seven feet appears to have been considered sufficient), in the midst of some dark forest, churchyard, vault, or other lonely and dismal spot. The C. was described at midnight in certain conditions of the moon and weather. Inside the outer C. was another somewhat less, in the centre of which the sorcerer had his seat. The spaces between the circles, as well as between the parallel lines which enclosed the larger one, were filled 'with all the holy names of God,' and a variety of other characters supposed to be potent against the powers of evil. Without the protection of this C., the magician, it was believed, would have been carried off by the spirits, as he would have been, had he by chance got out of the charmed space.

**CIRCLE, Mural**, an instrument used for determining the meridian altitude or zenith distance of a star. It consists of an astronomical telescope firmly fixed to a graduated circle, which moves about a horizontal axis, fixed in a strong vertical wall running north and south. In the common focus of the eye-piece and object-glass of the telescope is a system of cross-wires (spider lines are generally used for the purpose), one being horizontal, and five vertical, with equal spaces between. The line joining the optical centre of the object-glass with the intersection of the horizontal and middle vertical wires, is called the line of *collimation* of the telescope, and when the instrument is in perfect adjustment, this line moves in the plane of the meridian.



Mural Circle.

Besides the above-mentioned fixed wire, there is a movable one, called a micrometer wire, which is moved by means of a screw, remaining always parallel to the fixed horizontal wire.

If the instrument be so adjusted that the image of a star, while passing across the middle vertical wire in the field of view, shall at the same time be bisected by the fixed horizontal wire, the star is at that moment in the line of collimation of the telescope. It is therefore at that moment in the meridian, and its meridian zenith distance is the angle through which the circle would have been turned from the position it had when the line of collimation of the telescope pointed to the zenith. There is a fixed pointer, $p$, for the purpose of approximately reading the instrument. If the instrument were accurately adjusted, so that $p$ was opposite the zero point of the circle, when the line of collimation of the telescope pointed to the zenith, the arc *op*, in the above position of the instrument, would be the meridian zenith distance of the star.

Great nicety is required in 'reading' the instrument; i. e., in determining exactly the arc through which the circle has moved in bringing the telescope from the vertical to any other position, such as that represented in the figure. The rim is usually graduated at intervals of five minutes; and the eye could determine only the division nearest to the fixed index *p*. But by means of a 'reading microscope,' or Micrometer (q. v.), fixed opposite to the rim, as at *a* (the distance between the axis of which and the point *p* is constant), the portion of the interval to the nearest division on the rim can be read to seconds. There are usually six such microscopes fixed opposite different points of the rim; and the 'reading' of the instrument is the mean of the 'readings' of all the microscopes. This tends to eliminate errors arising from imperfect graduation and adjustment. If the instrument is properly adjusted, the zero point of the circle will be at *p* when the line of collimation of the telescope points to the zenith. In practice, however, this is not always accurately, or even approximately the case. As we shall immediately shew, it is of no consequence, as the final result of every observation is the *difference* between two readings.

It is evident that the difference between any two readings of the instrument will represent the angle through which the line of collimation of the telescope moves in passing from one position to the other. It remains to shew how a fixed point—viz., the Nadir (q. v.), is observed, and then how an observation is taken of the star itself in its meridian passage.

We must explain here that the fixed horizontal wire in the eye-piece of the telescope, in the instruments as now used, is only an *imaginary* line which determines the line of collimation of the telescope. It coincides with the position of the micrometer wire, when the screw-head of the micrometer marks zero.

To observe the nadir, a trough of mercury is placed underneath the instrument, and the telescope is turned so as to look vertically downwards into it. An image of the system of cross-wires which is in the common focus of the object-glass and eye-piece, will be reflected back again to nearly the same focus. Looking into the telescope, the observer now adjusts it by means of a tangent screw till the reflected image of the horizontal wire coincides with the real one. The final adjustment is perhaps most delicately effected by turning the screw-head of the micrometer which moves the wire itself. When they coincide, the line joining the centre of the object-glass of the telescope with the intersection between the middle vertical and horizontal micrometric wire, will be vertical. Now, the angle between this and the line of collimation of the telescope, which, as we have said, joins the optical centre of the object-glass with the intersection of the middle vertical and imaginary fixed horizontal wire, will, if the micrometer is in proper adjustment, be at once read off the micrometer screw-head. The instrument being clamped as above adjusted, the microscopes are read off, and the reading of the micrometer screw-head above mentioned being added to or subtracted from this reading, as the case may be, the nadir reading of the instrument is determined. The zenith reading, therefore, which differs from it by 180°, is at once known.

Again, to observe a star in the meridian, the instrument is previously adjusted so that the star, in passing the meridian, shall pass over the field of view of the telescope. As the image of the star approaches the centre of the field, the observer adjusts the telescope by the tangent screw, so as very nearly to bring the image of the star to the horizontal wire. Finally, just as the star passes the middle vertical wire, he bisects the image of the star with the horizontal wire by a touch of the micrometer screw-head. The circle being now clamped (or made fast), the 'reading' is determined as before by reading the pointer and microscopes, and adding or subtracting, as the case may be, the reading of the micrometer. This reading now subtracted from the zenith-reading gives the meridian zenith distance of the star; and this, again, subtracted from 90°, gives its meridian altitude above the horizon.

At the Royal Observatory of Greenwich, the principal observations are now made by an instrument which combines the mural C. with the transit instrument. See Transit Circle.

**CIRCLE,** Quadrature of. See Quadrature.

**CIRCLES OF THE SPHERE.** See Armillary Sphere.

**CI'RCUITS** (Fr. *circuit;* Lat. *circuitus*, a going round). In England.—England and Wales, with the exception of the county of Middlesex, are divided, for judicial purposes, into eight C., which the 15 judges visit twice or thrice a year, in pairs, for the purpose of adjudging civil and criminal causes. These C. are—the Home, the Midland, the Norfolk, the Oxford, the Northern, the Western, the North Wales, and the South Wales. Criminal charges within the county of Middlesex and the city of London and surrounding district, are disposed of at sessions which are held monthly at the central criminal court. Before and after term, the judges of the superior courts sit for the adjudication of civil causes in the Guildhall of the city of London, with the exception of the Lord Chancellor and the Vice-chancellor, who sit at Lincoln's Inn. 'These judges of assize came into use in the room of the ancient justices in eyre, *justiciarii in itinere*, who were regularly established, if not first appointed, by the parliament of Northampton, 1176 A.D., in the twenty-second year of Henry II., with a delegated power from the king's great court, or *aula regia*, being looked upon as members thereof.' Stephen's *Com.*, vol. iii. p. 415. See Assize and Nisi Prius. —Ireland is divided into the North-east, the North-west, the Home, the Leinster, Connaught, and Munster circuits. See Ireland, Judicial System.—Scotland. See Court of Justiciary.

**CIRCULAR NOTES** are bank-notes specially adapted for the use of travellers in foreign countries; and being, in fact, bills personal to the bearer, they are believed to be more safe as travelling money than ordinary notes or coin. C. N. are furnished by the chief London banking-houses. Those who wish to obtain them, determine beforehand what sum of money they will require on their journey, and that they pay to the banker, who, in exchange, gives C. N. to the amount, each of the value of £10 and upwards. Along with these notes is given a 'letter of indication.' This letter (a lithographed form in French) is addressed to foreign bankers, requesting them to pay the notes presented by the bearer, whom they name, and to aid him in any way in their power. By way of verification, the bearer appends his signature, and the letter is complete. On the back of the letter there is a long list of foreign bankers, extending all over Europe, any of whom will cash one or more of the C. N., on being presented and indorsed by the bearer; the indorsement being of course compared with the signature on the letter of indication, which is at the same time exhibited. In paying these notes, the money of the country is given, according to the course of exchange, and free of any charge for commission. For security, the letter and the notes should not be carried together, in case of being stolen or lost. These C. N. are doubtless a safe and convenient species of money, exchangeable in almost every town visited; and if any remain over on coming home, they will be taken back at their value by the banker who issued them. There are, however, certain drawbacks connected with these notes, which every traveller less or more experiences. In many, almost in all, instances, there is a difficulty in finding out where the banker named is to be found; for foreign bankers generally occupy obscure apartments several stories high, and not unusually in dingy out-of-the-way alleys. To discover them, a commissionaire may be necessary. Then, in some instances (in Paris invariably), the banker jealously scrutinises the bearer, asks to see his passport, and takes a note of the hotel at which he lodges; all which may be proper as a precaution against roguery, but it is not pleasant. Further, the C. N. are ordinarily of a thick stiff kind of paper, which does not well fit into a purse or pocket-book. On these several accounts, the careful class of travellers who keep to the main thoroughfares of France, Germany, and Belgium, will find £5 or £10 Bank of England notes, and sovereigns or napoleons, a preferable kind of money to take on their journey. W. C.

**CI'RCULAR NU'MBERS** are numbers whose powers end on the same figure as they do themselves: such are numbers ending in 0, 1, 5, 6.

**CIRCULAR PARTS**, the name given to a rule in spherical trigonometry, invented by Lord Napier. It is to be found in any treatise on that subject.

**CIR'CULATING DE'CIMALS.** See DECIMALS.

**CIRCULATING LIBRARY**, a collection of books lent out on hire—circulated from hand to hand. The plan of lending books on hire is not new. Chevillier, in his *Origines de l'Imprimerie de Paris* (4to, 1694), mentions that, in 1342, a century before the invention of printing, a law was framed in Paris to compel stationers to keep books to be lent on hire, for the special benefit of poor students and others. This fact is alluded to as follows, by E. S. Merryweather, in his entertaining work, *Bibliomania in the Middle Ages* (London, 1849): 'The reader will be surprised at the idea of a circulating library in the middle ages, but there can be no doubt of the fact, they were established at Paris, Toulouse, Vienna, and other places. These public librarians, too, were obliged to write out regular catalogues of their books, and hang them up in their shops, with the prices affixed, so that the student might know beforehand what he had to pay for reading them.' This writer, quoting from Chevillier, gives a list of books so lent out, with the prices for reading them. The books are all of a theological or classical kind. Among them is the Bible, the perusal of which is set down at 10 sous. 'This rate of charge,' it is added, 'was also fixed by the university, and the students borrowing these books were privileged to transcribe them, if they chose; if any of them proved imperfect or faulty, they were denounced by the university, and a fine was imposed upon the bookseller who had lent out the volume.' In these arrangements, we see the efforts that were made to procure the use of books before the art of printing had cheapened the cost of literature.

By whom the modern C. L. was projected, there is no record. All that can be given are a few facts on the subject. It is known that Allan Ramsay, author of *The Gentle Shepherd*, who was a bookseller in Edinburgh, established a C. L. in that city about 1725. Fond of dramatic literature, Ramsay appears to have incurred some local obloquy by lending out plays; and his wish to introduce a taste for the drama into Edinburgh may accordingly have suggested the notion of a circulating library. Be this as it may, the library which he began was continued through various hands for above a hundred years. At Ramsay's death in 1757, his library was sold to a Mr Yair, whose widow carried it on till 1780, when it was bought by Mr James Sibbald, an ingenious inquirer into Scottish literary antiquities. Sibbald lived some years as a literary man in London, during which period, beginning with 1793, the C. L. was carried on, subject to an agreement, by a Mr Laurie. Sibbald afterwards resumed the direction of the library, which he considerably extended. At his death in 1803, his brother attempted to carry it on; but not being successful in his management, he disposed of it in 1806 to Alexander Mackay, a person of extraordinary energy and perseverance. By the acquisition of various other libraries, Mr Mackay greatly enlarged the collection, which, under the name of the Edinburgh C. L., he conducted at 154 High Street. Here, by long continued and minute attention to business, Mr Mackay realised a competency, and he retired from active pursuits in 1831, when this extensive collection of books was broken up and sold by auction.

There are several circulating libraries in London, claiming to be of old date, but probably not so early as 1725. In a late reprint of an old advertisement, we see 'Proposals for erecting a Public Circulating Library in London,' under date June 12, 1742. This library was to be established 'in some convenient place at or near the Royal Exchange;' and the subscription was to be a guinea per annum. Two of the present circulating libraries are believed to be descended from this primitive stock. So numerous had circulating libraries become in the early years of the present century, that they absorbed whole editions of novels and romances prepared for the purpose by a London publishing establishment, designated the Minerva Press. The issue of cheap books and periodicals about 1832 (see BOOK-TRADE) seriously damaged the C. L. system; for people now bought instead of borrowing materials for light reading. The vast increase to the reading public in recent times, and the continually augmenting number of new and popular works of a respectable class, have been the means of restoring prosperity to circulating libraries, more especially in London, where some of them are on a surprisingly gigantic scale. To one library alone, as many as 100,000 new books are said to be added annually, and of kinds very different from those of the old Minerva Press school. The method of reading from these libraries consists in paying a sum per annum—usually a subscription of a guinea—for which a number of new books may at all times be procured, and kept for a specified period. When the books are no longer in demand, they are sold at reduced prices.

The method of circulating books among the members of private associations, is noticed under the head BOOK-CLUB; and that of circulating books in rural districts by means of libraries which are shifted from place to place, will be found in the article ITINERATING LIBRARIES. W. C.

**CIRCULA'TION**, in Anatomy and Physiology, is the term used to designate the course of the blood from the heart to the most minute blood-vessels (the Capillaries, q. v.), and from these back to the heart.

To simplify the consideration of the subject, we shall consider—1. The Anatomy of the Organs of Circulation—and, 2. The Physiology of the Circulation.

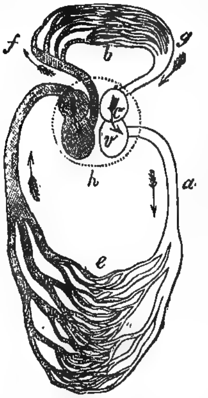


Fig. 1.—Mode of Circulation in Man and other Mammals, and in Birds:

*h*, heart; *v*, right ventricle; *v'*, left ventricle; *c*, right auricle; *c'*, left auricle; *a*, aorta; *d*, vena cava; *e*, greater circulation; *b*, smaller circulation; *f*, pulmonary artery; *g*, pulmonary veins.

1. The organs of C. consist of the heart, arteries, veins, and capillaries. The course of the blood through these organs will be best elucidated by the aid of a diagram, which is equally applicable for all other mammals as well as for man, and for birds. The shaded part of fig. 1 represents structures filled with impure or venous blood, while the unshaded portion represents structures in which pure, oxygenated, arterial blood occurs. In this diagram we observe a dotted circle, representing a closed bag or sac, termed the pericardium, and enclosing the four cavities *c*, *v*, *c'*, *v'*, of which the heart is composed. Two of these cavities, *c* and *c'*, are for the purpose of receiving the blood as it flows into the heart, and are termed the *auricles;* while the two cavities *v* and *v'* are for the purpose of propelling the blood through the lungs and general system respectively, and are termed the *ventricles.* The vessels that transport blood into the auricles are termed *veins*, and the vessels through which the blood is driven onwards from the ventricles are known as *arteries* (q. v.). The diagram further shews that what we commonly term the heart, is in reality *two distinct hearts* in apposition with each other—one, shaded in the figure, which is called the right, or venous, or pulmonary heart; and the other, unshaded, which is called the left, or arterial, or systemic heart—the last name having been given to it, because the blood is sent from it to the general system; just as the right heart is termed pulmonary from its sending blood to the lungs. We will now trace the course of the blood as indicated by the arrows in this diagram, commencing with the right auricle, *c*. The right auricle contracting upon the venous or impure blood with which we suppose it to be filled, drives its contents onwards into the right ventricle *v*, through an opening between these two cavities, called the right auriculo-ventricular opening, which is guarded by a valve, named the tricuspid—from its being composed of three pointed membranous expansions—which almost entirely prevents the regurgitation or reflux of the blood from the ventricle into the auricle. The ventricle *v* being now filled, contracts, and as the blood cannot return into the auricle, it is driven along the shaded vessel, the dividing branches of which are indicated by *f*. This vessel is known as the pulmonary artery, and conveys the blood to the lungs. At its commencement, it is guarded by valves, termed, from their shape, the semilunar pulmonary valves, which entirely prevent the blood which has once been propelled into the pulmonary artery from re-entering the ventricle. The pulmonary artery gradually divides into smaller and smaller branches, which ultimately merge into capillaries. In these capillaries, which are freely distributed over the interior of all the air-cells (of which the lung is mainly composed), the venous blood is brought in contact with atmospheric air, gives off its carbonic acid gas (which is its principal impurity), and absorbs oxygen, by which processes it is converted into pure or arterial blood. The capillaries, *b*, in which the blood is arterialised, gradually unite to form minute veins, which, again, join to form larger vessels, until finally the blood is collected into a small number of vessels known as pulmonary veins, which pour their contents into the left auricle. Only one such vessel, *g*, is shewn in the figure, because the main object of this diagramatic scheme is to illustrate the mode and general direction in which the blood circulates, not to indicate the special vessels through which it flows in different parts of the body. The actual number of the pulmonary veins is four—viz., two from each lung. The blood, now fitted for the various purposes of nutrition, enters the left auricle, *c'*, which by its contraction propels it into the left ventricle, *v'*, through the left auriculo-ventricular opening. This opening, like the corresponding one in the right heart, is guarded by a valve which, from its form, is termed the mitral valve, and which entirely prevents the reflux of the blood. The left ventricle, *v'*, contracts and drives its contents into the large artery, *a*, which represents the aorta—the great trunk which, by means of its various branches (none of which are indicated in the diagram), supplies every portion of the body, from the crown of the head to the soles of the feet, with pure arterial blood. From the aorta and its various subdividing branches, the blood passes into the capillaries, *e*, which occur in every part of the system; in these capillaries it undergoes important changes, which may be considered as almost exactly the reverse of those which occur in the pulmonary capillaries: it parts with its oxygen, becomes charged with carbonic acid, and, as it leaves the capillaries, and enters the minute veins formed by their union, presents all the characters of venous blood. The veins gradually unite till they form two large trunks, termed the superior and inferior *venæ cavæ*, which pour their contents into the right auricle—the point from which we started. Only one of these great veins, *d*, is indicated in the diagram. We thus perceive that there is a complete double C.—that there is a lesser C. effected by the blood in its passage from the right to the left heart through the lungs; and that there is a greater C. effected by that fluid in its passage from the left heart through the system generally to the right heart.

From the above simple ideal scheme, we proceed to the consideration of the more complicated arrangements by which the C. is actually effected in man and the higher animals.

The heart is situated in very nearly the centre of the cavity of the chest, or *thorax*, as it is termed in anatomy, between the lungs, behind the breast-bone, or *sternum*, in front of the vertebral column, and above the diaphragm, on which it obliquely rests. Its form is somewhat conical, the lower end tapering almost to a point, and directed rather forwards and to the left. This lower portion alone is movable, and, at each contraction of the heart, it is tilted forwards, and strikes against the walls of the chest between, in man, the fifth and sixth ribs, or a little below the left nipple. All the large vessels connected with the heart—the *venæ cavæ*, the pulmonary artery, and the aorta—arise from its base (see fig. 2), and serve, from their attachment to the neighbouring parts, to keep that portion of it fixed. Indeed, these vessels may be regarded as suspending the heart in the cavity, which is lined by a smooth serous membrane, which, near the top, is reflected downwards over the roots of the great vessels, and covers the whole of the outer surface of the heart. These two smooth serous surfaces—one lining the cavity, the other investing the heart—are kept moist by a fluid which they secrete, and by this arrangement, friction may be regarded as reduced to its minimum. The cavity or sac in which the heart lies is called the pericardium. Like all serous membranes, it is a closed sac, and, as it may not be easy for the non-professional reader to understand the relative position of the heart, which is at the same time surrounded by and external to this membrane, we may observe that the head in an old-fashioned double night-cap—which is a closed bag—is in much the same position as the heart in the pericardium; it is inside the night-cap, but not in the cavity which intervenes between its two layers.

The substance of the heart is essentially muscular. The fibres run in different directions, longitudinally and transversely, but most of them obliquely; many pass over the apex from one side of the heart to the other; and all are so involved as to render it very difficult to unravel them. In consequence of this arrangement, the fibres, by their contraction, seem simultaneously to diminish each cavity in all directions, and thus serve most efficiently to drive the blood onwards. The size of the heart has been estimated as about that of the closed fist of the same individual. Its weight, as compared with that of the body, was determined by Dr Clendinning to be 1 : 160 in the male, and 1 : 150 in the female. The same physician carefully examined nearly four hundred hearts of persons of both sexes, and determined the average weight at about 9 oz. avoirdupois, while Dr John Reid found the average weight of the male heart to be a little more than 11 oz., and that of the female heart to be a little above 9 oz.

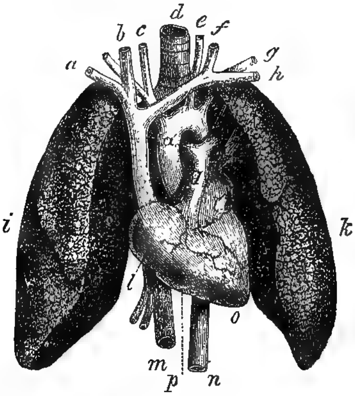


Fig. 2.—The Lungs, Heart, and principal Blood-vessels in Man:

*a*, *h*, veins from the right and left arms; *b*, *f*, right and left jugular veins, returning the blood from the head and neck—these four veins unite to form a single trunk, the *vena cava superior*, which enters the right auricle, *l*; *c*, *e*, the right and left carotid arteries, the latter rising directly from the arch of the aorta, *a*, the former from a short trunk called the *arteria innominata*; *g*, the left subclavian artery, rising directly from the aorta, while the right subclavian springs from the *arteria innominata*; *d*, the trachea or windpipe; *i*, *k*, the right and left lungs; *l*, *l'*, the right and left auricles; *p*, the right ventricle; *o*, the apex of left ventricle; *m*, the inferior or ascending *vena cava*; *n*, the descending aorta, emerging from behind the heart; *q*, the pulmonary artery.

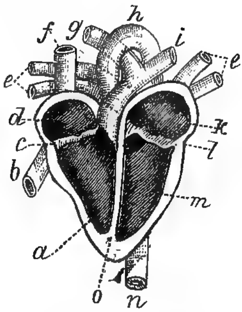


Fig. 3.—Theoretical Section of the human Heart:

*f*, *b*, the two *venæ cavæ*, opening into *d*, the right auricle; *c*, the tricuspid valve; *a*, the right ventricle, from which proceeds the pulmonary artery, dividing into branches *g* and *i*, going to the right and left lung respectively; *e*, *e'*, the pulmonary veins (two from either lung), entering into the left auricle, *k*; *l*, the mitral valve; *m*, the left ventricle, from which proceeds the aorta, whose arch is indicated by *h*, and the descending portion by *n*, none of its branches being indicated in this figure; *o*, the partition, or *septum*, between the right and left hearts.

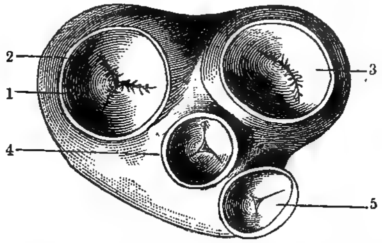


Fig. 4.—Valves of the Heart and Arteries.

Upper surface of the Heart, the Auricles having been removed. In this figure the heart is turned in such a position that the anterior surface lies lowermost; hence the apparent discrepancy of the *right* auriculo-ventricular orifice lying on the *left* side of the diagram.

1, Right auriculo-ventricular orifice, obliterated by the tricuspid valve; 2, fibrous ring surrounding this orifice; 3, left auriculo-ventricular orifice, surrounded by a ring, and closed by the mitral valve; 4, orifice leading into the aorta from the left ventricle, closed by the semilunar valves; 5, orifice leading into the pulmonary artery from the right ventricle, also provided with three semilunar valves.

In our ideal sketch of the organs of C. (fig. 1), we have indicated the different cavities into which the heart is divided. In fig. 3 there is represented a section of the human heart, which is sufficiently like the reality to give the reader a fair idea of the position of its various parts. The two theoretical hearts, which were nearly in contact in fig. 1, are here fused into a single organ, but the division of the two sides is still as complete, in so far as the functions of the heart are concerned, as in the ideal scheme. We see a strong vertical partition separating the entire heart into two halves, which are very similar to each other. In the accompanying figure (fig. 4), we have a representation of all these valves—the auricles having been removed so as to give a distinct view of the upper surface of the ventricles. The tricuspid and mitral valves, which are entirely closed—the two ventricles contracting simultaneously—are represented by 1 and 3 respectively; while the pulmonary and aortic semilunar valves, which, when closed, always present a concave surface towards the lungs, are indicated by 4 and 5. The walls of the ventricles are much thicker than those of the auricles, and those of the left ventricle are about four times as thick as those of the right; the amount of muscular tissue being, in all these cases, proportional to the work to be done. All details regarding the anatomy of the heart, except such as bear directly upon the C., would be out of place in this article, and we shall, therefore, omit all notice of many structures which present themselves on opening its various cavities. We will merely add, that the heart receives the arterial blood necessary for its own nutrition from the coronary arteries, two trunks which are given off by the aorta immediately above the semilunar valves; and that this blood having discharged its function, is carried back to the right auricle by the coronary veins; this blood obviously having the shortest possible systemic circulation.

Since all the arterial blood leaves the heart through the aortic opening, in tracing its course to the different parts of the system, we obviously have only to follow the aorta to its final branches. Referring to the article AORTA, where the principal branches of that great organ are indicated, it is sufficient, without further anatomical details, to say that the final ramifications of the arteries distribute the arterial blood to the Capillaries (q. v.), which pervade every part of the body.

The *veins* like the arteries, are found in nearly every tissue; they commence by minute plexuses (an anatomical term for a network-like arrangement), which communicate with the capillaries. Branches from these plexuses uniting together, form small venous trunks, which, by joining, increase in size as they pass onward towards the heart. If we except certain venous structures (called *sinuses*) occurring in the interior of the skull, we may divide the veins into two sets—the *superficial* or *cutaneous*, and the *deep* veins.

The deep veins accompany the arteries, and are usually enclosed in the same sheath of cellular tissue with them. In the case of the smaller arteries, they generally exist in pairs, one on each side the artery, and are called *venæ comites*, while the larger arteries have usually only one accompanying vein.

The superficial veins occur immediately beneath the integument; they not only return the blood from the skin and adjacent structures, but communicate with the deep veins.

All the veins finally unite into two large trunks, termed the *superior* and *inferior vena cava*, which open into the right auricle of the heart; the superior vena cava being formed by the union of the veins which return the blood from the head and neck (the jugulars) with those which convey it from the arms (the subclavians), as shewn in fig. 2; while the inferior vena cava (also shewn in the same figure) receives the blood from the lower extremities, the trunk, and the abdominal and pelvic viscera.

We must refer to the article VEIN for the structure of the walls of this part of the circulating system. There is only one point that imperatively requires notice here—viz., that while the arterial system presents no valves, except at the points where the two great trunks leave the heart, the veins contain a great number of valves, which are formed by a doubling of their lining membrane, and resemble pocket-like folds or pouches, which allow the blood free passage towards the heart, but prevent its reflux.

There is one part of the venous C. which, from its great importance, requires special notice—viz., that of the venous blood of the spleen, pancreas, stomach, and intestinal canal. The blood supplied to these organs by the cœliac axis and the two mesenteric arteries is not returned directly to the vena cava, and thence to the heart, as occurs in other parts of the system. The veins of these organs unite together into one large vessel, called the *vena portæ*, which, entering the liver, branches out again like an artery, and finally subdivides into a capillary network that permeates the whole of its mass. It is from the venous blood, as it traverses these capillaries, that the bile is secreted. This portal blood, together with the blood of the hepatic artery, after it has become venous, is finally carried off by the hepatic veins (usually three in number), which open into the inferior vena cava.* Thus the blood which flows through the portal vein passes through two sets of capillaries, between the period of its leaving the aorta and entering the vena cava.

Our knowledge of the true course of the C.—viz., that the blood propelled from the left side of the heart, after traversing the arteries, returned by the veins to the right side of the heart; and the blood of the right side, passing through the pulmonary artery, traversed the lungs, and returned by the pulmonary veins to the left auricle—is of comparatively recent date. Harvey's celebrated work, *Exercitatio de Motu Cordis et Sanguinis*, was not published till 1628, although there is good reason to believe that it was written nine or ten years previously. Before the appearance of this celebrated work, which marks an epoch in physiological science, the views that were held on this subject were so vague that it is unnecessary for us to enter into any notice of them. (The reader who takes an interest in this point is referred to Dr Willis's *Life of Harvey*, prefixed to his translation of Harvey's Works, for the Sydenham Society.) In one point, Harvey's proof of the course taken by the blood was defective; the microscope had not then revealed the existence of the capillaries, and he was consequently altogether at fault as to the mode by which the blood passed from the arteries to the veins. By a strange coincidence, Malpighi, who discovered the corpuscles by which the motion of the blood in the capillaries can be traced, was born in the course of the very year (1628) in which Harvey's work was published.

The double C. which we have described, is the course performed by the blood from the time of birth during the whole period of life. The C. of the blood, however, begins before birth—indeed, at a very early period of intra-uterine or fœtal existence; and the circumstance that before birth the lungs do not act as organs of respiration, induces a very important modification in the course of the blood in fœtal life, which will be described under FŒTUS.

We now leave for the present the C. in man, and proceed to notice some of the leading peculiarities of the C. in other animals. In the warm-blooded animals—mammals and birds—the course of the blood is *essentially* the same as in man, for in all these animals the heart, like the adult human heart, possesses four distinct cavities. In form, however, it presents certain peculiarities in some of the mammalia. It is generally more rounded and less elongated than in man. In the cetacea, it is very broad and flat; and in at least one genus, the dugong, the right and left ventricles are separated by a deep fissure. In some herbivorous mammals, as in the ox, sheep, goat, &c., a cruciform ossification, called the bone of the heart, is found in the septum between the ventricles. In the ornithorhynchus, or duck-billed platypus, the heart, in some respects, resembles that of birds. We likewise find certain varieties in the distribution of the blood-vessels. Thus, while in man the subclavian and carotid arteries arise on the right side from a short common trunk given off by the aorta, and on the left side arise directly from the aorta, we find several varieties of this arrangement in the mammalia. In the horse and the ruminants, the aorta divides at once at its origin into an anterior trunk, which gives off the carotid and subclavian arteries of both sides, and a posterior trunk for the thoracic and abdominal aorta. In the dolphin, and in some—if not all—of the bats, two short trunks (*arteriæ innominatæ*) arise, and give off each a carotid and subclavian on either side. In the elephant, both carotids are given off from a single common trunk, situated midway between the two subclavians. All these, and other varieties which might be noticed, are occasionally found in man; and it may be laid down as a general rule, that when any abnormal arterial distribution is detected in the human subject, it represents the normal type in some lower mammal.

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* In fishes, not only the blood of the intestines, but that of the posterior part of the body, enters this portal system, which is distributed in this class of animals both to the kidneys and to the liver.

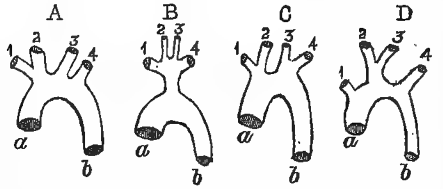

Fig. 5.—Diagram of certain varieties in the Origin of the Main Trunks from the Arch of the Aorta:

A, Man; B, the Ruminants; C, Dolphin and Bats; D, the Elephant. 1, the right subclavian; 2, right carotid; 3, left carotid; 4, left subclavian; *a*, ascending aorta; *b*, descending aorta.

A very remarkable peculiarity in the distribution of the vascular system (both arteries and veins) is exhibited by the cetacea and other diving animals, in which the respiration, and consequently the arterialisation of the blood, is temporarily stopped. Various arteries of the trunk here assume a ramified and convoluted form, so as to constitute reservoirs capable of holding a large quantity of pure blood; while the venous trunks exhibit similar dilatations, capable of receiving and retaining for a considerable time the impure blood which has circulated through the system, and of thus preventing the right heart from being overcharged with venous blood during the temporary suspension of respiration. By means of these arterial reservoirs, the cetacea can support life under water for a quarter of an hour, or even longer.

Another peculiarity deserving of notice is, that occasionally a large artery will divide into a great number of smaller vessels, which again reunite to form a single trunk. An arrangement of this kind is known as a *rete mirabile*, and a good example of it occurs within the skull in long-necked grazing animals, the object being to check too strong a current of blood to the brain.

In birds, the heart is usually of a very large size, as compared with the bulk of the body. The trunk of the aorta is extremely short, and divides into three main branches, the central one forming the descending aorta, while the two lateral ones give off the carotid and subclavian arteries on either side. The branches of the latter give an abundant supply of blood to the powerful thoracic muscles by which the wings are moved.

In the class of reptiles, there is not a complete double C., a mixture of arterial and venous blood being sent both to the lungs and to the general system. In fig. 6, the general nature of the C. in this class is typically represented. The heart consists of two auricles and one ventricle. The impure blood which has circulated through the system is conveyed by the vena cava into the right auricle, from whence it passes into the common ventricle. At the same time, blood which has been aërated in the lungs is poured into it from the left auricle; hence the ventricle contains an admixture of venous and arterial blood. As both a pulmonary artery and an aorta are given off by the ventricle, the latter by its contractions simultaneously drives one portion of its contents to the lungs, and another to the general system. In this way, a semi-oxygenated blood is transmitted to the various parts of the body, the only pure blood being that which is contained in the left auricle, and in the veins opening into it.

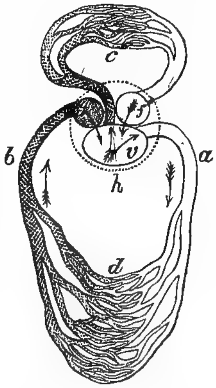

Fig. 6.—Circulation in Reptiles:

*h*, heart, enclosed in pericardium; *f*, *f′*, right and left auricles; *v*, single ventricle; *a*, aorta; *b*, vena cava; *c*, smaller circulation; *d*, greater circulation.

Although the above may be regarded as the *general* type of the circulating apparatus in reptiles, yet there are many modifications of it (into which we have not space to enter), which connect it on the one hand (in the case of the *Perennibranchiate amphibia*, such as the axolotl, proteus, &c.) with that of fishes, and on the other hand (when there is a more or less perfect separation of the ventricular cavity, as in the crocodiles) with that of birds and mammals.

In the class of fishes, the circulating apparatus is far simpler than in reptiles. The heart possesses only two cavities, an auricle and a ventricle, and is traversed solely by venous blood; hence it is analogous to the right side of the mammalian heart. Venous blood is brought by veins, which correspond with our *venæ cavæ*, from all parts of the system, and enters the auricle (see fig. 7); from the auricle, the blood passes into the ventricle, which is of great muscular strength; and the ventricle propels its contents through a vessel which corresponds with our pulmonary artery, and which dividing on either side into four or five branches, goes to the gills, in the capillaries of which it becomes oxygenated, by means of the air that is diffused through the water. From the filaments and fringe-like structures of the gills, it is at length collected into a large trunk, commonly called the dorsal vessel, but analogous to the aorta of mammals and birds, in so much as it supplies the whole body with arterialised blood. After passing through the systemic capillaries, the blood returns in a venous condition to the heart, and the above process is repeated. Although the heart is simpler than in reptiles, the C. is in one sense of a higher character, in so far

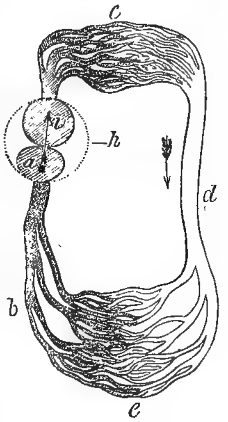

Fig. 7.—Circulation in Fishes:

*h*, heart, enclosed in pericardium; *a*, the auricle; *v*, the ventricle; *c*, the capillary circulation in the gills; *d*, the dorsal artery; *e*, the systemic capillaries; *b*, the veins.

as pure arterial (not mixed) blood is here conveyed to all parts of the system; hence, probably, the far greater muscular energy of fishes may be explained.

We can only allude very briefly to the C. in the invertebrate animals.

In the mollusca, we find hearts of varying complexity,* usually with one or two auricles, and one ventricle; but in all cases, the auricle or auricles receive aërated blood from the respiratory organs, and pass it to the strongly muscular ventricle, which propels it over the body. The heart is therefore a *systemic* heart. There seem to be no capillaries in these animals, excepting in the respiratory organs; the blood leaving the open ends of the arteries, passes into the interstices (*lacunæ*) of the parenchyma of the body, from whence it is taken up by the open mouths of the venous radicles; hence this kind of C. is called lacunary.

In the crustacea, the form of the heart and the number of its orifices presents several modifications; the following is, however, the *typical* mode of C. of these animals. The heart, which is here a single cavity, is sometimes round, and sometimes long and tubular, and is the point of departure of the arterial system, which consists of trunks emerging in various directions. The blood returning from the arteries does not enter into distinct veins, but into irregular excavations in the tissues, which are termed venous sinuses; from these venous sinuses it passes to the gills, from whence it is returned to the heart in an aërated state by the branchio-cardiac canals; so that here, as in the mollusca, the heart is systemic.

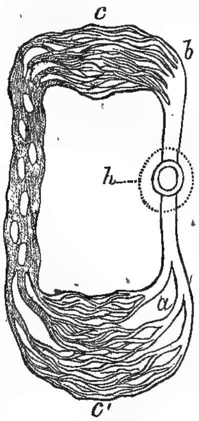

Fig. 8.—Circulation in the Crustaceans: *h*, the heart and pericardium; *a*, the arteries; *c'*, the systemic capillaries; *c*, the branchial or respiratory capillaries; *b*, the branchio-cardiac vessels.

It is unnecessary for us to notice the comparatively imperfect C. in insects and animals lower in the scale than those we have already considered.

We now approach the last part of the subject—the physiology of the circulation.

We shall consider—1. The flow of blood through the heart; 2. The phenomena of the arterial C.; 3. The phenomena of the capillary C.; and, 4. The phenomena of the venous circulation.

1. Direct observation and experiment clearly shew, that the muscular contraction of the heart is the principal source of the power by which the blood is propelled in its course. This action of the heart may be observed by opening the chest of a living animal, or, better still, of an animal deprived of sensation and motion by poison, and in which artificial respiration is kept up. It is then seen to consist of two motions—first, a contraction or systole of the auricles, and second, a corresponding contraction of the ventricles. The contraction of the auricle immediately precedes that of the ventricle, and the systole of each cavity is directly followed by its diastole or relaxation; there is then a brief period of repose, the heart exhibiting little or no motion. At the moment of the systole of the ventricles, the apex of the heart is tilted forwards, causing a pulsation against the ribs that can be felt externally.

The force exerted by the left ventricle has been so very variously estimated, that we must regard this point as still unsettled. The number of contractions of the heart of an adult in a minute is about 70 or 75; it is, however, liable to great variations, which will be noticed in the article PULSE. The sounds accompanying the heart's action, which may be readily heard by applying the ear either directly or through the medium of the stethoscope to the cardiac region, are discussed in the article HEART, SOUNDS OF THE.

2. The arteries exercise a vast influence on the movement of the blood through them, in virtue of two properties which they possess—viz., elasticity and contractility. These two endowments are not equally and uniformly possessed by the whole arterial system—elasticity (the property by which the interrupted or discontinuous force of the heart is made equable and continuous) existing chiefly in the larger trunks; while contractility—which is more required for regulating the flow of blood to particular parts—is most marked in the smaller vessels. The rate of movement of the blood through the arteries in man can only be roughly calculated from experiments on animals. Volkmann finds that in the carotids of mammals, the average velocity of the blood-stream is about 12 inches per second; he has likewise ascertained that the velocity is greater in arteries lying near than in those at a distance from the heart, that it is not increased by an augmentation in the number of pulsations, but that it is greatly augmented by an increase in the volume of the blood, and lessened by its diminution.

3. It has long been a debated point, whether the capillary C. is influenced by any other agency than the contractility of the heart and arteries. Harvey believed that the action of the heart alone was sufficient to send the blood through the whole circuit, and in recent times his view has been supported by J. Müller and other eminent physiologists. On the other hand, Professor Draper of New York holds the opposite extreme view, asserting that 'it is now on all hands conceded that the heart discharges a very subsidiary duty.' We believe that Bichat was the first to maintain the opinion, that the capillaries are organs of propulsion, and are alone concerned in returning the blood to the heart through the veins. Although Bichat attributed too great power to the capillaries, there cannot be a doubt that the movement of the blood through these vessels is not solely due to the heart; in short, that there is what may be termed a capillary power. The following are a few of the facts proving this to be the case: 1. On watching the C. in the web of a frog's foot, it is at first seen to go on with perfect regularity. After a time, however, various changes are observed, which cannot be attributed to the heart, such as alterations in the size of some capillaries, and in the velocities of the currents passing through them, and occasionally even a reversal in the direction of some of the lesser currents. 2. In cold-blooded animals, the movement of the blood in the capillaries continues long after the excision of the heart. 3. Actual processes of secretion not unfrequently continue after death; sweat, for instance, may be exuded from the skin,

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* In some of the ascidians and in salpa, the following remarkable phenomenon occurs: The heart, which is extremely simple, and of course without valves, at definite intervals (of about twenty minutes) reverses the direction of its current. Before the heart changes the direction of its contractions, it remains still for a short time, and the blood-currents in the body are thus slackened in their course before they receive an impulse in the opposite direction. The vessels entering and leaving the heart thus act alternately as an aorta and as a vena cava.

and other secretions may be formed by their respective glands, which could not take place if the capillary C. had stopped. 4. Cases occasionally occur in which a fœtus without a heart is produced, and yet in these cases most of the organs are well developed.

What the nature of this capillary power is, is not clearly known. Professor Draper and others have endeavoured to explain it on the principles of capillary attraction. There is no satisfactory evidence that the capillaries possess true contractility, for, although their diameter is subject to great variations, this may be due simply to the elasticity of their walls. If we could only establish their contractility, the difficulty would be removed.

The rate of movement of the blood through the capillaries is about 1·2 inch per minute in the systemic capillaries of the frog. In the warm-blooded animals it is probably more rapid. From Volkmann's observations, the rate in the dog is about 1·8 inch per minute.

4. It is usually estimated that the venous system contains from two to three times as much blood as the arterial. The latter is probably the more correct ratio, and, as the rapidity of blood in the two systems seems to bear an inverse ratio to their respective capacities, the venous blood will move with only one-third of the velocity of arterial blood. We have already noticed the occurrence of valves in the venous circulation. Their object is evidently to prevent the reflux of blood; hence they are of important use in the maintenance of this part of the circulation. They are most abundant where there is much muscular movement. The movement of blood through the veins is undoubtedly mainly due to the *vis a tergo* resulting from the contraction of the heart and arteries. This is much assisted in many parts of the system by the constantly recurring pressure of the adjacent muscles upon their trunks. The movement of inspiration, by causing a comparative vacuum in the chest, has been supposed by some physiologists to assist the flow of venous blood to the heart, and a similar influence has been ascribed to an assumed suction-power of the heart. The contractility of the veins in man is too slight to produce any marked effect on the propulsion of the current. From the investigations of Professor Wharton Jones 'on the rhythmical contractility of the veins of the bat's wing,' we may infer that, in many of the lower animals, it is probably a more efficient power. In connection with this article, consult Artery, Capillaries, Pulse, and Vein.

**CIRCULA'TION OF SAP** in plants—its ascent from the root to the leaves and bark, and its partial descent after the elaboration which it undergoes in these organs. The sap drawn from the ground by the roots (see Osmotic Action) ascends in exogenous plants, which have hitherto been principally the subjects of examination, through the more recent parts of the woody tissue, and especially through the alburnum. The descent of the sap takes place chiefly through the liber or inner bark. It appears certain also that, on its return to the root, only a small portion is excreted, and that the greater part ascends again, readapted to the use of the plant by the excretion which has taken place. Much of the sap which is taken up by the roots is, however, thrown off in perspiration by the bark and leaves. The sap is also laterally diffused through the cellular tissue of plants, and very interesting observations have been made by Schultz and others on peculiar movements of the elaborated or descending sap (*latex*). Many physiologists dislike the term *circulation* applied to sap, as suggesting a closer analogy than really exists to the circulation of the blood in animals. See Plant, Leaves, and Sap.

**CIRCUMCI'SION** (Lat. a cutting around), the cutting off the foreskin (*præputium*), a rite widely diffused among ancient and modern nations. The prevalent idea among Christians was (and perhaps still is), that the rite originated with Abraham, who (as we read in Gen. xvii. 9—14) was commanded by God to circumcise himself and his whole household, and to transmit the custom to his descendants. But, as Jahn (*Biblische Archäologie*, Vienna, 1797—1800) acutely observes, this is inconsistent with the very terms in which the command is expressed, these terms pre-supposing a knowledge of the rite on the part of Abraham. That it existed previously to the time of the patriarch, however, seems to be indisputable. The researches of modern scholars prove that the Egyptians, for instance, were in the habit of circumcising long before Abraham was born. Rawlinson, in a note to his version of Herodotus, remarks that 'circumcision was already common in Egypt at least as early as the fourth dynasty of kings, and probably earlier, long before the birth of Abraham, or 1996 B.C.' The testimony borne by the monuments of Upper and Lower Egypt (consult Sir Gardiner Wilkinson's *Manners and Customs of the Ancient Egyptians*) is to the same effect, and apparently conclusive. Another argument which has been adduced against its Abrahamic origin, is the fact of its being so extensively practised. At the present day, it may be traced almost in an unbroken line from China to the Cape of Good Hope. It is also a usage in many of the South Sea Islands, and the followers of Columbus were much astonished to find it existing in the West Indies, and in Mexico. Recently, too, it has been ascertained to have been long practised by several tribes in South America. Such being the case, many scholars hold it impossible to suppose that the origin of so universal a rite can be traced to a single Semitic nation, more especially when that nation was peculiarly averse to intercourse with other nations, and in other respects exercised no overt influence on their customs. Whether, as Jahn supposes, Abraham obtained his knowledge of C. from the Egyptians, we cannot determine. It would appear, however, that the Canaanites among whom he came to reside were not circumcised, for we read of the Prince of Shechem and his people undergoing the operation, that the former might obtain the hand of Dinah, daughter of Jacob; and the institution of it in the family of Abraham was probably sufficient to mark off that family from the surrounding tribes. In the case of Abraham and his descendants, the rite acquired a religious significance. It was ordained to be the token or seal of the everlasting covenant between God and his people. Such is the view of St Paul, who looked upon the C. of the foreskin as symbolical of the C. of the heart; and that along with all that was merely Judaistic and material, it was abrogated by the more spiritual teaching of Christ.

The time for C. among the Jews is the 8th day after the birth of the child; among the Arabians, the 13th year, in remembrance, it is said, of their ancestor Ishmael; among the Kaffirs, at a still later period, marking, in fact, the transition from youth to manhood; and, indeed, each nation seems to have selected the time most agreeable to its own notions of what is prudent or becoming. The Abyssinians are the only people professing Christianity among whom C. is practised. The C. of females, or what is equivalent to such, is not unknown among various African nations. For fuller information in regard to C., consult Sonnini's *Travels in Egypt*, Sir John Marsham's *Chronicus Canon Ægyptiacus*, and Winer's *Biblisches Realwörterbuch*.

**CIRCU'MFERENCE**, or **PERI'PHERY**, the curve which encloses a plane figure: thus, we speak of the circumference of a circle, or of an ellipse; but in figures bounded by straight lines, as the triangle, square, and polygon, the term *perimeter* is employed to designate the whole bounding lines taken together.

**CIRCUMNAVIGA'TION**, the term usually applied to the act of sailing round the world, its literal meaning being simply a sailing round. The C. of the globe was at one time considered a great feat, but it is now regarded as one of the most commonplace affairs in a sailor's experience. The first to circumnavigate the globe was Magalhaens (q. v.), or Magellan, a Portuguese, in 1519; eighteen years afterwards, it was accomplished by a Spaniard; and in 1577 by the illustrious Englishman, Drake. The most celebrated of circumnavigators, however, was Captain James Cook, who, between 1768 and 1779, made three voyages round the world.

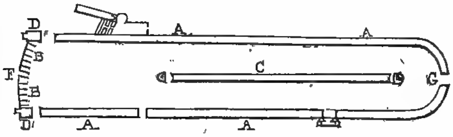
**CIRCUMSTA'NTIAL E'VIDENCE.** See Evidence.

**CIRCUMVALLA'TION**, in Fortification, is a series of works surrounding a place when under siege; not to serve offensively against the place, but to defend the siege-army from an attack from without. It usually consists of a chain of redoubts, either isolated or connected by a line of parapet. Such lines were much used in the sieges of the ancient and middle ages; but in modern times they are not so necessary, because the use of artillery lessens the duration of a siege, and also because the besiegers have generally a corps of observation in the open field, ready to repel any force of the enemy about to succour the besieged. A remarkable example of C. was that at Sebastopol, where, while a circuit of batteries fired upon the town, an outer circuit of redoubts and lines kept off the Russians who were in the open field; but the necessity for this arose out of the smallness of the besieging force compared with that of the besieged. The narrow escape of the allies from utter overthrow at Inkermann, shewed the necessity for this external defence. For the relation which C. bears to Countervallation, see that article.

**CIRCUMVE'NTION.** See Fraud.

**CI'RCUS.** See Harrier.

**CIRCUS, The**, of ancient Rome, was a large oblong building, adapted for chariot-races and horse-races, and used also for the exhibition of athletic exercises, mock-contests, and conflicts of wild beasts. The Circensian Games were alleged by tradition to have originated in the time of Romulus, when they were dedicated to Consus or Neptune, and called *Consualia*. After the first war undertaken by Tarquinius Priscus, in which he captured the Latin city of Apiolæ, his victory was celebrated by games. A space was marked out for a C., and the senators and knights were allowed to erect scaffoldings round it for themselves. The games continued to be held annually, and a permanent edifice was soon afterwards constructed. This was distinguished, subsequent to the erection of the Flaminian and other large circi, as the Circus Maximus. It must have been altered and enlarged at various times. According to different computations, it was capable of holding 150,000, 260,000, or 385,000 persons. Its extent also has been variously estimated. In the time of Julius Cæsar, it was three stadia or 1875 feet long, and one stadium or 625 feet wide, while the depth of the buildings surrounding the open space was half a stadium, or about 312 feet. All the circi in Rome, of which there were a considerable number, are now completely destroyed; but a small C. on the Appian Way, about two miles from Rome, known as the Circus of Caracalla, is still in a state of preservation. Its construction is believed to have differed very little from that of similar buildings. The annexed wood-cut will give some idea of the arrangement and relative dimensions of its parts.



Circus.

Along the sides and at the curved end (round the lines AA), were ascending ranges of stone seats for the spectators. At the other end, BB, were the *carceres*, or stalls, which were covered, and furnished with gates, and in which the horses and chariots remained until, on a given signal, the gates were simultaneously flung open. In the centre is the *spina*, C, a long and broad wall round which the charioteers drove, terminating at both ends at the *metæ*, or goals—three cones of carved wood which marked the turnings of the course. At each extremity of the *carceres* is a stone tower, DD. From its gates and castellated appearance, the whole of this side received the name of *oppidum*, a town. Over the *carceres* were seats for the president of the games, the consuls, or other distinguished persons. There were four entrances, of which the most important were the *Porta Pompæ*, F, and the *Porta Triumphalis*, G. The games were inaugurated by a procession from the Capitol, in which those bearing the images of the gods went first, and were followed by the performers in the games, the consuls, and others. This procession entered through the *Porta Pompæ*, while the *Porta Triumphalis* was that by which the victors left the circus.

The *spina*, an object conspicuous from its situation, was in general highly decorated by such objects as statues, small temples, altars, &c. In the *spina* of the Circus Maximus, two very large obelisks were erected by Augustus and Constantius. This C. was also distinguished by six towers, and by a canal or *euripus*, formed by Julius Cæsar, to protect the spectators more effectually during the conflicts of wild beasts.

The C. was especially adapted for races, an amusement of which the Romans were passionately fond. The length of a race was seven circuits round the *spina*, and 25 races were run in each day. The number of chariots was usually four. The charioteers adopted different colours, representing the four seasons. Bets and party-spirit ran high, and the victor received a substantial pecuniary reward at the end of the race. The athletic exercises, such as boxing and wrestling, which sometimes terminated fatally, were probably exhibited in the large open space between the *carceres* and the *spina*. The *Ludus Trojæ* was a mock-conflict between young men on horseback. A regular battle was sometimes represented (*Pugna Equestris et Pedestris*). By the formation of canals and the introduction of vessels, a *Naumachia*, or sea-fight, was occasionally exhibited; but, under the empire, this species of exhibition, as well as the *Venatio*, was gradually transferred to the Amphitheatre (q. v.). In providing for the *Venatio*, or hunting of wild beasts, vast sums of money were expended. Animals were procured from every available part of the Roman empire, including Africa and Asia. The exhibition not only afforded an opportunity for the display of private munificence or ostentation, but attained the importance of a political engine, which none who aspired to popularity ventured to overlook. When Pompey opened his new theatre, he is said to have given public exhibitions in the C. for five days, during which 500 lions and 20 elephants were destroyed.

In modern times, the C. stands but as the shadow of a name. It is about the same size as the modern theatre, and is employed principally for the exhibition of feats of horsemanship and for acrobatic displays.

**CI'RENCESTER**, or **CI'CESTER**, a parliamentary borough in Gloucestershire, on the Churn, an upper branch of the Thames, and on the Thames and Severn Canal, 17 miles south-east of Gloucester. It has four chief streets, and the appearance of opulence, though it has but little trade. A complete agricultural college was founded here in 1846 on a farm of 600 acres. Pop. 6096. C. returns two members to parliament. C. was the Roman *Corinium-Ceaster*, at the junction of five Roman roads, and has traces of ancient walls two miles in circuit. Roman relics have been found here, as coins, urns, baths. Canute held a council here in 1020 to expel Ethelwolf. Rupert stormed C. in 1642 and 1643, and it was afterwards given up to Essex.

**CIRRHO'PODA**, or **CIRRI'PEDA** (Gr. or Lat. cirrhus-footed), the animals which formed the genus *Lepas* of Linnæus, ranked by him among the multivalve *Testacea*, and by subsequent naturalists very generally regarded as an order of mollusks, until, in consequence of recent discoveries, a place has been assigned them among the *Articulata*, either as a distinct class of that great division of the Animal Kingdom, or as a sub-class of *Crustacea*. Barnacles (q. v.) and *Balani* or Acorn-shells (see BALANUS) are the most familiar examples of C.; but many species are now known, all exhibiting much general similarity to these, all marine, and all in their mature state permanently attached to objects of various kinds, as rocks, sea-weeds, shells, &c. Some are found imbedded in corals, others in the thick skin of whales, some in the flesh of sharks. They are distributed over the whole world; the species, however, are not numerous anywhere; those species which adhere to fixed bodies are in general much more limited in their geographic range than those which attach themselves to floating objects or to vertebrate animals. They are generally divided into two orders, *Pedunculated* and *Sessile*, those of the former order being supported on a flexible stalk, which is wanting in the latter. Barnacles are pedunculated C., and *Balani* are sessile.

The resemblance of C. to mollusks consists chiefly in their external appearance. In the more important parts of their organisation, however, the C. resemble crustaceans rather than mollusks. The gills, when these exist, occupy the same relative position as in crustaceans; but the aëration of the blood is supposed to be also effected in the *cirrhi*, as the limbs or organs have been generally called, of which there are six pair on each side, and which may be described as long tapering arms, each composed of many joints and *ciliated* or fringed with stiff hairs. The *cirrhi* nearest the mouth are shortest, and all of them together form a sort of net for the capture of minute animals, being incessantly thrown out by the cirrhopod from a lateral opening of its sac, and drawn in again in such a manner as to convey any prey which they may have caught to the mouth. Almost all the C. are hermaphrodite; but in a few genera the sexes are distinct, and these exhibit an anomaly of a very remarkable kind, the males being not only very small in comparison with the females, and more short-lived, but, in their mature state, *parasitic* on the females, or attached to them as they are to other objects; whilst in some the still more remarkable anomaly appears of what have been called *complemental* males, attached in this way to hermaphrodites. The eggs of C. are hatched before being finally set free from the body of the parent. The young possess the power of locomotion, swimming freely in the water, and are furnished with eyes, which disappear after they have permanently fixed themselves, by instinctive choice, in situations adapted to their kind. They have also shells, quite different from those of their mature state. The shelly coverings of the C. are all formed according to a certain type, but with many variations, and they differ extremely in the number of pieces or valves of which they consist, some, as the common barnacles, having only five valves, and others having additional small pieces arranged in whorls, and exceeding 100 in number. In most of the C., the shelly covering is very complete; in some, it is almost rudimentary.

The most important discoveries concerning the structure and metamorphoses of the C., determining their place in the animal kingdom, were made by Mr J. V. Thompson. For the most extended examination of species, and for an admirable monograph, published by the Ray Society, the scientific world is indebted to Mr Darwin.

**CI'RRHUS**, **CI'RRUS** (Lat. a curl, or lock of hair), or **TE'NDRIL**, in Botany, a leaf altered into a slender spiral, which, by twisting around such objects as it comes in contact with, attaches the plant to them, and enables it to climb, when otherwise, through the weakness of its stem, it must have been prostrate. There are many varieties of C., as it is merely an elongation of the midrib of a pinnate leaf—an altered terminal leaflet, or becomes compound by the alteration of several leaflets, or occupies altogether the place of a simple or compound leaf, and is accordingly either simple or branching. Examples of different kinds may be seen in the pea, vetch, vine, passion-flower, &c.—The term C. is also employed in zoology, to designate any curled filament, and has been applied, but not quite aptly, to the curiously modified feet of the *Cirrhopoda*.

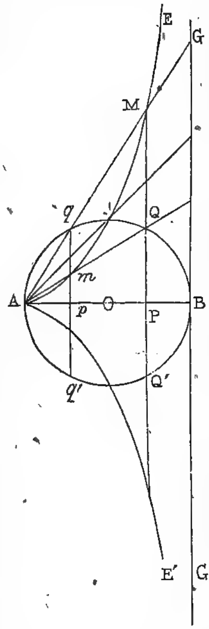
**CI'RRUS.** See CLOUDS.

**CIS**, a Latin preposition meaning, 'on this side,' which is often prefixed to names of rivers and mountains to form adjectives; Cisalpine, Cispadane, 'on this side of the Alps,' 'of the Po.' As most of these words are of Roman origin, Rome is considered the point of departure.

**CISA'LPINE REPU'BLIC.** After the battle of Lodi, in May 1796, General Bonaparte proceeded to organise two states—one on the south of the Po, the Cispadane Republic, and one on the north, the Transpadane. These two, however, were in 1797 united into one under the title of the C. R., which embraced Lombardy, Mantua, Bergamo, Brescia, Cremona, Verona, and Rovigo, the duchy of Modena, the principality of Massa and Carrara, and the three legations of Bologna, Ferrara, and the Romagna. The republic had a territory of more than 16,000 square miles, and a population of 3½ millions. Milan was the seat of the government or Directory, and the place of meeting of the Legislative Assembly, which was composed of a senate of 80 members, and a great council of 160. The army consisted of 20,000 French troops, paid by the republic. A more intimate connection was formed in 1798 between the new republic and France, by an alliance offensive and defensive, and a treaty of commerce. The republic was dissolved for a time in 1799 by the victories of the Russians and Austrians, but was restored by Bonaparte, after the victory of Marengo, with some modifications of constitution and increase of territory. In 1802 it took the name of the Italian Republic, and chose Bonaparte for its president. A deputation from the republic in 1805 conferred on the Emperor Napoleon the title of King of Italy; after which it formed the kingdom of Italy till 1814.

**CISSA'MPELOS** (Gr. ivy-vine), a genus of plants of the natural order *Menispermaceæ*, of which some of the species possess valuable medicinal properties; particularly *C. Pareira*, a native of the West Indies and warm parts of America, the root of which is known by the names of *Pareira Brava* and *Butua Root*. The plant is called Velvet Leaf in the West Indies, from the peculiar and beautiful appearance of the leaves. It is a climbing shrub, with roundish-triangular leaves, racemes of small yellow flowers, and small hairy scarlet berries. The root appears in commerce in pieces of two or three feet long, varying from the thickness of the finger to that of the arm, tough, but so porous that air can be blown from end to end of it. It has a sweetish, afterwards nauseous taste; is used as a tonic and diuretic, appears to exercise a specific influence over the mucous membrane of the urinary passages, and is administered with advantage in chronic inflammation of the bladder. It was formerly supposed to possess great lithontriptic powers, which it was even hoped would put an end to all necessity for lithotomy. It is supposed that the roots of other plants of the same order are often fraudulently mingled with it; but those of several species of C., both American and East Indian, appear to possess pretty nearly the same properties. An alkaloid, called *Cissampelin*, exists in this root, and gives it its properties.

**CI'SSOID OF DI'OCLÉS**, a curve first employed by Diocles the mathematician, whose name it bears, for the purpose of solving two celebrated problems in geometry—viz., the trisection of a plane angle, and the construction of two geometrical means between two given straight lines. Let AB (see fig.) be the diameter of any given circle, and PQ, *pq*, any two ordinates at equal distances from the centre O. Then, if we draw a straight line through A and either of the points *q*, Q, and produce it till it cuts the other ordinate, produced if necessary, the point of intersection, M, or *m*, will, in its different positions, trace out a curve called a *cissoid*. The circle AB is called the generating circle, and the diameter AB is called the axis of the curve. It is clear from the figure that the C. must consist of two infinite symmetrical branches, AE and AE′, having a cusp point at A. The straight line GB tangent at B to the generating circle, is a common asymptote to these branches. Taking A as origin, and AB = *q* and a line at right angles to it, through A, as axes of co-ordinates, the equation to the C. is $y^2 = \frac{x^3}{(a-x)}$. The curve may be constructed mechanically. The area of the space included between the two branches and their asymptote, is equal to three times the area of the generating circle. If, instead of a circle, we employed any other curve as the generating curve, the curve generated in the same way as the C. of D., is called *cissoidal*. The word cissoid comes from the Greek *cissos*, ivy, and *eidos*, form.



Cissoid.

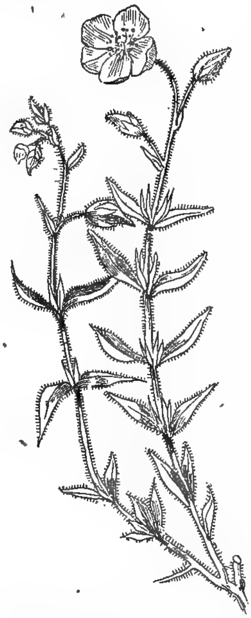
**CI'SSUS.** See VITACEÆ.

**CISTE'RCIANS**, a religious order, taking its name from the parent monastery of Citeaux (Cistercium), near Dijon, which was founded in 1098 by the Benedictine abbot, Robert of Molême. Through the influence chiefly of St Bernard of Clairvaux, who became a monk of Citeaux in 1113, the order, within little more than a century after its foundation, was in possession of more than 1800 abbeys in France, Germany, England, Ireland, Denmark, Norway, and Sweden. The C. were distinguished from the order of Clugny by their severer rule and stricter poverty, avoiding everything like splendour in their churches, even gold and silver crosses; by being submissive to the jurisdiction of the bishops, at least till after the death of St Bernard; by not meddling with the cure of souls; by wearing a white robe with a black scapulary; and by their peculiar form of government, which was introduced by Innocent III., in 1215, into all the monastic orders. In France, the members of this order called themselves Bernardines, in honour of St Bernard. Among the fraternities emanating from the C., the most remarkable were the Barefooted monks or Feuillans, and the nuns of Port Royal in France, the Recollets or reformed Cistercian nuns in Spain, and the Trappists. The number of Cistercian abbeys in England, in the reign of Henry VIII., was 75, besides 26 Cistercian nunneries. In Scotland, there were 11 abbeys, and 7 nunneries. Among the English abbeys were Woburn, Tintern, Furness, Fountains, Kirkstall, and Rievaux; among the Scottish, Melrose, Dundrennan, Kinloss, Glenluce, Culross, Deer, Balmerino, and Sweetheart or New Abbey. The chief French abbeys, *les quatre premières filles de Citeaux*, as they were called, were La Ferté, Pontigny, Clairvaux, and Morimond. Riches and indolence brought this powerful order, as well as others, into decay. Even before the Reformation, many of their convents had ceased to exist. The French Revolution reduced the C. to a few convents in Spain, Poland, Austria, and Saxony.

**CI'STERN**, a tank for holding water. In places where the supply of water is intermittent, or where rain-water is used, every house requires a C. or water-butt. Cisterns are much used for the supply of steam-engine boilers at railway-stations. They are variously constructed—many of cast or wrought iron, of deal lined with lead or zinc, or of impervious pavement or slate slabs, in which last two cases the sides and bottom are grooved, and cemented together with white-lead putty, or some other cohesive substance, to prevent leakage; and the sides, if the dimensions be at all large, are frequently bound together by means of wrought-iron rods; but very large cisterns are generally made cylindrical, so that the pressure acting at all points equally from the centre, the strain comes longitudinally on the outside, and tie-rods can be dispensed with, which is an advantage, as the holes for the tie-rods are apt to be a cause of leakage. See WATER SUPPLY.

**CI'STUS** (Gr.), or **R'OCK-ROSE**, a genus of exogenous plants, which gives its name to the natural order *Cistaceæ*; an order allied to *Cruciferæ* and *Capparideæ*, and containing about 200 known species of shrubs and herbaceous plants, chiefly natives of the south of Europe and north of

Africa. The flowers have generally five petals, very delicate; the stamens are numerous, the style simple, the fruit a capsule. Many species of this order are more or less resinous; and from the twigs of some species of *Cistus*, natives of the south of Europe and the Levant, particularly *C. Creticus*, *C. Cyprius*, and *C. ladaniferus*, the resinous substance called *Ladanum* is obtained, which is used as a stimulant, chiefly in plasters, but has become obsolete in British medical practice. Many species of *Cistus* are much cultivated for the beauty of their flowers, which are red, white, lilac, yellow, or frequently of two colours, and are common in gardens and green-houses. Most of the larger kinds require in Britain some protection in winter. The only plant of the order which extends to Scotland is *Helianthemum vulgare*, the yellow flowers of which are a frequent ornament of dry hill-slopes.



Helianthemum Vulgare.

**CI'TADEL** (from the Italian *cittadillo*, 'a little city') is a fort of four or five bastions, in or near a town. A C. serves two purposes: it enables the garrison of a town to keep the inhabitants in subjection; and, in case of a siege, it forms a place of retreat for the defenders, and enables them to hold out after the rest of the town has been captured. A C. must fully command the fortifications of the city, and have a large space round it clear of buildings.

**CITA'TION**, the act of calling a party into court to answer to an action, to give evidence, or to perform some other judicial act. Being derived from the civil law, the term C. is known in England chiefly or exclusively in the ecclesiastical courts. But it is in frequent use in the legal systems both of France and Scotland. In Scotland, a C. is done in the Court of Session by an officer of court, or by a Messenger-at-arms (q. v.), under authority either of a summons passing the Signet (q. v.), or under a warrant by the court. In inferior courts, citations are generally given by officers of court on warrants issuing from the courts to which they are attached. The copies of C. delivered to the parties must have the day and date of delivery, and the names and designations of the witnesses written at length, and they must be signed by the messenger.

Where the party, though amenable to the court, is not resident in Scotland, he must be cited edictally, by a copy of the C. being left at the office of the keeper of edictal citations (see Edictal Citation), by whom lists of such citations are printed and published. Formerly, this C. was effected by a proclamation at the market-cross of Edinburgh, and the pier and shore of Leith.

In criminal cases, the party cannot appear voluntarily in court: he must be cited, and can plead any omission in form, which cannot be obviated even by consent. This form of C. is regulated by 9 Geo. IV. c. 29, commonly called Sir William Rae's Act. A full and correct copy of the libel, or charge against him, must be served on the panel, or accused, with a list of witnesses, and of the assize, or jury. A notice, intimating the day of compearance, must be marked on the copy of the libel, and subscribed by the officer and a witness. This C. must proceed on a warrant issuing from the court before which the accused is to be tried. It may be executed either by a Macer (q. v.), a Messenger-at-arms (q. v.), or a Sheriff-officer (q. v.) of the county within which the C. is made (11 and 12 Vict. c. 79, s. 6). If the panel can be found personally, the C. must be delivered to him, but if not, it must be left at his dwelling-place with his wife or servants; or if access cannot be obtained, the officer must affix a copy to the principal door of the house (1555, c. 33).

Citation for interrupting Prescription.—Either the positive or negative prescription may be interrupted by citation in an action. See Prescription.

**CI'TIZEN** (Fr. *citoyen*, Lat. *civis*). Aristotle defines a C. to be one to whom belongs the right of taking part both in the deliberative, or legislative, and in the judicial proceedings of the community of which he is a member (*Politics*, iii. 1). A C., therefore, can exist only in a free state. Between a C. and a subject, there is this distinction, that whilst the latter merely is governed, the former also governs; and thus, though every C. is a subject, many subjects are not citizens. In this, which was also the sense attached to the term by the Romans, when used in its highest meaning—that; viz., of the *civis optimo jure*—it has passed to the modern world, gradually coming to be so understood everywhere. In the heroic ages of Greece, the idea of citizenship was but imperfectly understood. The members of the council and assembly were mere advisers of the kings, who, as god-descended, were regarded as monarchs in the strict sense. But something of the C. character even then attached to the immediate followers of the chief, when regarded in opposition to slaves and strangers; and it was from them that the dominant class sprang, which everywhere overthrew the monarchies, and established the small self-governing states—the democracies, or rather aristocracies, of Greece. At first, the rights of citizenship in Athens and other Greek communities were readily attained by those who were not born to them; but at a later period, when the organisation of Greek civic life had reached a high degree of perfection, admission to the roll of citizens was procured with great difficulty. In Sparta, indeed, according to Herodotus, so sparing were they of their national privileges, that there were only two instances of their conferring them in their full measure on strangers. The Periœci, or strangers by origin, who shared the Spartan territory, though not on equal terms with the Spartans, were probably, as regarded political rights, pretty much in the same position with the Roman plebeians. In Rome, there were perfect and less perfect citizens, whose respective positions are thus described by Savigny in his *History of the Roman Law in the Middle Ages:* 'In the free republic, there were two classes of Roman citizens—one that had, and another that had not, a share in the sovereign power. That which peculiarly distinguished the higher class, was the right to vote in a tribe, and the capacity of enjoying magistracy.' All the private rights of citizenship (the *jus connubii* and *jus commercii*) belonged to the citizens of the lower class, but the public rights of voting in a tribe, and of enjoying the honours of the magistracy (*suffragium et honores*), were denied them. Under these two classes, again, there were two others—the Latini and the Peregrini.

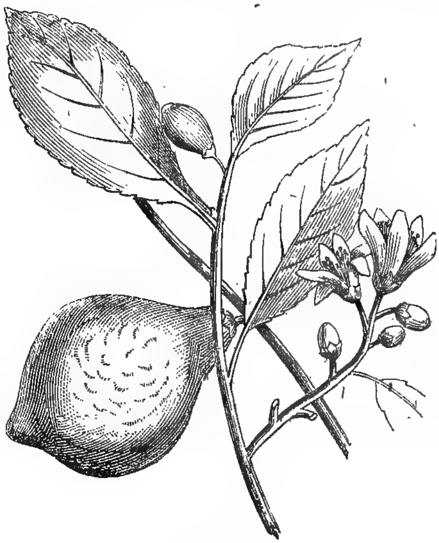
Roman citizenship was acquired most commonly by birth, but for this, it was requisite that both father and mother should be citizens. If a C. married a Latina, or a Peregrina, even believing her to be a C., the children begotten of the marriage followed the status of the mother. But latterly, it was permitted, by a decree of the senate, to the parents to prove their mistake, and thus to raise both the mother and her children to the rank of citizens. In earlier times, the citizenship could be conferred on a stranger only by means of a *lex*—i. e., by a vote of the people assembled either in one or other of the Comitia (q. v.). It was conferred at a single sweep on the whole of the Latini and Socii. In the case of some of the provinces, both in Italy and Gaul, the *Latinitas* was given as a step to the *Civitas*, the former being converted into the latter in the case of any one who had exercised a magistracy in his own state or city.

When the imperial power was established, the public rights which formed the chief characteristic of the full Roman citizenship, became little more than empty names; and the only value which thenceforth attached to it consisted in the private rights which it conferred. Such as it was, the constitution of Caracalla extended it to the whole Roman world, the distinctions between Cives and Peregrini and Latini being preserved only in the case of certain individuals, such as freedmen and their children. Even this distinction was abolished by the legislation of Justinian, the only divisions of persons henceforth being into subjects and slaves. A fuller account of this interesting subject will be found in Smith's *Dictionary of Greek and Roman Antiquities.*

In its modern use, the term C. is applied in Great Britain to a dweller in a town, and this either in the general sense of an inhabitant, or in the narrower and stricter sense of one who enjoys its privileges and franchises. In France, it denotes any one who is born in the country, or naturalised in it; and in America, it is used in the same sense, only that there there is a slave population whom it does not include. In this latter acceptation, it is equivalent to the term *subject* in England.

**CI'TRIC A'CID** is an organic acid present to a considerable extent in limes and lemons, and to a less extent in gooseberries, currants, raspberries, strawberries, and other fruits. In preparing C. A. the juice is allowed to ferment, and chalk being added, a precipitate of citrate of lime is formed. This precipitate being treated with sulphuric acid, sulphate of lime is formed, and the acid remains in solution. It is a tribasic acid, having the symbol $C_{12}H_5O_{11}$. It is readily soluble in water, and has an intensely sour taste; it is used in medicine, especially in the form of lemon-juice, as an anti-scorbutic, and in the arts by the silk-dyer to heighten the colours of safflower and cochineal, and by the calico-printer for discharging mordants from cloth. C. A. is a constituent of the finer kinds of lemonade, ginger-beer, &c.

**CI'TRON** (*Citrus medica;* see CITRUS), a tree cultivated in the south of Europe, and other warm, temperate, or sub-tropical countries for its fruit; a native of the forests of the north of India. By many botanists, it is regarded as a mere variety (or perhaps the original type) of the species which produces also the lemon, sweet lemon, lime, and sweet lime; by others, these, or some of them, are regarded as distinct species. The C. has oblong toothed leaves; the flowers are externally of a violet colour; the fruit is large, warted, and furrowed; the rind very thick and tender; the pulp sub-acid. The pulp is refrigerant; but the part chiefly valued is the rind, which has a delicious odour and flavour, and is made into a very agreeable preserve. The juice is sometimes employed to make a syrup, or, with sugar and water, for a beverage, and for flavouring liquors. The rind and juice may be said generally to be applicable to the same purposes as those of the lemon, but the juice is less acid. The CEDRATE is a variety of the C., from which chiefly the fragrant Oil of C., or OIL OF CEDRATE, used by perfumers, is procured. In Germany, the name Cedrate is extended to all kinds of C., and the name C. is usually given to the lemon. The varieties of C. are numerous. The fruit of the largest kinds is sometimes 9 inches long, and 20 lbs. in weight. The C. is frequently cultivated in Britain, and by the aid of artificial heat and the protection of glass is produced in great perfection.



Citron.

It is probable that the C. is meant in some passages of the Old Testament where the word apple is used in the English version.

**CITRO'SMA**, a genus of trees of the natural order *Monimiaceæ*, of which the leaves abound in an oil resembling, if not identical with, oil of citron. They are natives of the tropical parts of South America.

**CI'TRUS**, a genus of plants of the natural order *Aurantiaceæ*, consisting of trees and shrubs, natives of India and other warm parts of Asia, but many of which are now commonly cultivated in all warm climates on account of their fruit. To this genus belong the ORANGE, CITRON, LEMON, LIME, BERGAMOT, SHADDOCK, POMPELMOOSE, FORBIDDEN FRUIT, &c. See these heads. It is distinguished by numerous stamens, irregularly united in bundles by their filaments, a pulpy fruit with a spongy rind, and smooth seeds. The leaves and the rind of the fruit abound in volatile oil. The flowers also contain volatile oil, and exhale a peculiar fragrance.

**CITTADE'LLA**, a town of Northern Italy, in the government of Venice, 14 miles north-east of Vicenza. It is situated on the Brentella, an affluent of the Brenta, is walled, and has manufactures of woollen and paper. Pop. 6600.

**CITTA' DI CASTE'LLO**, a town of Central Italy, 25 miles north-west of Perugia. C. has a very pleasant situation on the left bank of the Tiber. Though a place of only some 5400 inhabitants, it is exceedingly rich in ecclesiastical structures of Gothic architecture, palatial residences, and works of art. Raphael painted many of his early works in C. di C.; and they were to be found in churches and private galleries here until the French invasion, when they were dispersed. Two small pictures of this great master still remain in Citta di Castello. Silk-twist is the chief manufacture of the town.

**CITTA VE'CCHIA.** See MALTA.

**CI'TY** (Fr. *cité*, Lat. *civitas*). In the sense in which it was first used in the Romanic languages of modern Europe, the word C., like its Latin original, was probably equivalent to State (q. v.) (*respublica*) rather than to town or borough (*urbs*, *municipium*); and whilst the latter signified a collection of hearths and households, governed by municipal laws internally, but subject externally to the laws of the country of which they formed a part, the latter was applied only to such towns as, with their surrounding district, were independent of any external authority whatever. Nearly the only cities in this sense now are the free towns of Germany, and such of the cantons of Switzerland as consist chiefly of a town and its surroundings, for example, Geneva. But as the ancient Gauls, though composing one nation, were divided into tribes, living in different cantons, each with its town, to which the term *civitas* was applied, and as they also acknowledged a species of central authority, several cities sending delegates to a central one of greater extent and importance to discuss their common affairs, there is reason to believe that the term C. was applied *par excellence* to these central places of meeting, and that it thus, from a very early period, signified a *capital* or *metropolis*, though not independent. In England, the term is said to be confined to towns or boroughs which are or have been the seats of bishops' sees, but this restriction rests on no sufficient ground. 'The cities of this kingdom are certain towns of principal note and importance, all of which either are or have been sees of bishops; yet there seems to be no necessary connection between a city and a see.'—Stephen's *Com.*, i. p. 124. In America, the term is applied to all towns which are incorporated and governed by a mayor and aldermen. See BOROUGH.

In the case of towns which have grown greatly beyond their original dimensions, it is not unusual to give the name of C. to the space which they originally occupied—thus, we speak of the C. of London, the C. of Paris, of Vienna, &c.

**CITY OF REFUGE.** The Jewish law (Numb. xxxv., Deut. iv., Josh. xx.) set apart six cities, three on each side of Jordan, as cities of refuge for the manslayer, in which he might find an asylum, and be safe from the avenger of blood. See BLOOD, AVENGER OF. These cities were Hebron, Shechem, and Kadesh-Naphtali on the west of Jordan; Bezer, Ramoth-Gilead, and Galan, on the east. The Jews were careful to keep the roads to the cities of refuge clear, and signs were set up to shew the way. The manslayer was received and protected in the C. of R. until the death of the high-priest, after which the avenger of blood had no longer any claim against him. Thus this peculiar institution was connected with the typical institutions of the Jewish religion, and partook somewhat of their character, whilst it modified and restrained the avenging of blood. The C. of R. afforded no permanent protection to the murderer, who, if his crime could be proved against him, was to be taken from it that he might be put to death.

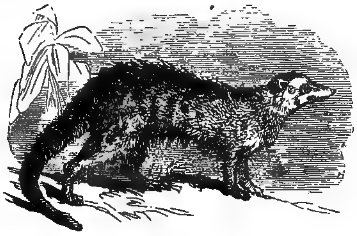
**CIUDA'D** (from the Lat. *civitas*) is the Spanish word for 'a city;' and is used as a prefix corresponding to the English affix *town*, as in

**CIUDAD REA'L**, a town of Spain, capital of the province of the same name, situated on a plain between the rivers Guadiana and Jabalon, about 100 miles south of Madrid. It is surrounded with walls in parts ruinous, and has some handsome houses; but, on the whole, it is a poor dull place. It has two or three fine churches—the nave of the parish church being one of the finest Gothic specimens of the kind in Spain—and several monasteries. There are manufactures to a small extent of coarse woollens, linen, and table-cloths, and a trade in the agricultural produce of the district. Pop. 10,000.

**CIUDAD RODRI'GO** (Roderic's Town), a fortified town of Spain in the province of Salamanca, about 50 miles south-west of the city of that name. It is situated on an elevation above the river Agueda, which washes the walls, and is here crossed by a fine bridge. It has a cathedral, the earliest portion of which dates from the 12th century. The town generally has a mean appearance, and is not over-cleanly. During the Peninsular War, C. R., though of little strength itself, was considered a place of the utmost importance, as a key of Spain on the west, and was consequently an object of ambition both to the French and the allies. In June 1810, the French under Massena invested the town, and after a gallant defence by the Spaniards, it was forced to surrender on the 10th July. The fact that Wellington was in the immediate vicinity, with an army of 30,000 men, and afforded no relief whatever, was a subject for outcry against the hero; but subsequent events at Torres Vedras shewed that his policy was the right one. In January 1812, after a siege of 11 days, the place was assaulted, and after a bloody struggle, the British succeeded in capturing the town. The storming is one of the most brilliant achievements recorded in British military annals, and important as it was brilliant; 150 guns fell into the hands of the captors, besides vast stores of every kind, and the moral effect was even more than proportionately great.

**CIUDADE'LA**, a seaport town of the island of Minorca, situated on a plain on the west coast, in lat. 39° 58′ N., long 3° 52′ E. It is walled, and has a cathedral, also several convents. The inhabitants, numbering between 7000 and 8000, are engaged in agriculture, and in the manufacture of woollen fabrics. A considerable trade is carried on at the port.

**CI'VET** (*Viverra*), a genus of carnivorous quadrupeds, of the family *Viverridæ* (q. v.), having the body elongated, in some of the species as much as in the weasel tribe; the head is also long, and the muzzle sharp. The ears are short, broad, and rounded. The feet have five toes, and the claws are only semi-retractile. There is a more or less conspicuous erectile mane along the back, as in hyænas. Between the anus and the sexual organs, in both male and female, there is a large double pouch, in which is secreted a peculiar odoriferous fatty substance, called *Civet*, much used as a perfume. The use of this pouch and its secretion to the animal is not very well known. There are several species of C., of which the best known is the common or African C. (*V. civetta*), a native of the north of Africa. The common C. is from two to three feet long. The height is from ten inches to a foot; the hair long, brownish gray, with numerous black bands and spots. The C. preys on birds, small quadrupeds, and reptiles, and generally takes its prey by surprise. It is very commonly kept in confinement for the sake of its perfume, which is removed from the bag about twice a week by means of a small spatula, and is obtained most abundantly from the male, and especially after he has been irritated. A dram is a large quantity to obtain at a time. The civets kept for this purpose are fed on raw flesh; the young partly on farinaceous food. The town of Enfras, in Abyssinia, is a principal seat of the C. trade, and great numbers are there kept.



Civet.

**CIVIDA'LÉ**, a walled town of Venetia, Northern Italy, about 10 miles east-north-east of Udine, situated on the Natisone, which is here crossed by a bridge. C. is the ancient *Forum Julii*, and its collegiate church, a fine Gothic edifice, dates from the 8th century. In its archives are contained some valuable manuscripts. It has silk and cotton factories, and a population of some 6000.

**CI'VIL DEATH.** Death, in a legal point of view, is either natural or civil: the former being the cessation both of physical life and of the legal rights which attach to it; the latter, the cessation of the legal rights whilst the physical life remains. 'Civil death occurs where a man, by act of parliament or judgment of law is attainted of treason or felony; for immediately upon such attainder he loses (subject indeed to some exceptions) his civil rights and capacities, and becomes, as it were, *dead* in law. It also took place formerly where any man abjured the realm by the process of the common law; or entered into religion, that is, went into a monastery, and became there a monk professed; in which cases he was absolutely dead in law, and his next heir should have the estate. Even in the times of popery, the law of England took no cognizance of *profession* in any foreign country, because the fact could not be tried in our courts; and therefore, since the Reformation, this disability is held to be abolished; as also the disability of banishment, consequent upon abjuration, by stat. 21 Jac. I. c. 28.' Stephen's *Com.*, vol. i., pp. 142, 143.

**CIVIL ESTA'BLISHMENTS**, of the Army, comprise certain departments which, though provided for out of the Army Estimates, are non-military in their organisation; such as those connected with the manufacture of munitions of war.

**CIVIL LAW.** See LAW, MUNICIPAL; and LAW, ROMAN CIVIL.

**CIVIL LIST.** Down to the period of the Restoration in 1660, notwithstanding an attempt at negotiation between James I. and the parliament for the commutation of the hereditary revenues of the crown, the whole expenses of the government of England, civil and military, were included in one list, or rather they were defrayed out of what was called the royal revenue. This revenue arose partly from crown-lands, and partly from other sources, and for a long period after the Conquest, it was really at the disposal of the crown. Even after the supplies were provided by parliament, the specific mode of their expenditure continued to be free from parliamentary control. But at the Restoration a distinction was made (by statute 12 Charles II.) between the extraordinary expenses occasioned by war, and the ordinary cost of the civil establishments of the country. For the latter, the needful funds were provided, partly from such crown-lands as were still unalienated, and partly from taxes which parliament voted for the purpose at the commencement of each reign. These were called the hereditary or C. L. revenues. During the reign of William III., the C. L. amounted to £680,000 annually. The branches of expenditure included under this head were the following: 1. The royal household; 2. The privy purse; 3. The royal palaces; 4. The salaries of the chancellor, judges, great officers of state, and ambassadors; 5. The incomes given to the other members of the royal family; 6. The secret-service money, pensions, and other irregular claims. The support of the army and navy was now provided for by an annual vote of the House of Commons, and the interest of the national debt was never charged against the civil list. During Queen Anne's reign, matters remained nearly on their former footing; but on the accession of George I., the C. L. was raised to £700,000 a year, and on that of George II., to £800,000. George III., notwithstanding that he had surrendered very large portions of the remaining hereditary revenue of England, accepted the last-mentioned sum. But it proved insufficient for the purpose. A large amount of debt was incurred, and in 1769 and 1777, parliament voted sums for his relief, amounting together to more than £1,000,000. In 1777, the C. L. revenue was raised to £900,000, but further deficiencies to the extent of £270,000 had still to be supplied by extraordinary votes. In 1780, Mr Burke succeeded in abolishing several useless offices, and reducing the expenditure. Notwithstanding these and other efforts in the same direction, it was found indispensable continually to augment the C. L. revenue. In 1804, it was raised to £960,000, and in 1812, to £1,080,000, besides annuities to members of the royal family, which were now paid out of the Consolidated Fund (q. v.) to the amount of £260,000. When George IV. succeeded to the throne, £255,000 of expenditure was transferred to other funds, and the C. L. was then fixed at £850,000 per annum. The crown enjoyed, in addition, the hereditary revenue of Scotland, amounting to about £110,000, and a separate C. L. was kept up for Ireland of £207,000. Against these large sums, however, were still placed many charges which belonged to the nation rather than the crown; and it was not till the 15th November 1830 that Sir Henry Parnell, afterwards Lord Congleton, carried a motion for the appointment of a select committee for the purpose of separating the proper expenses of the crown from all other charges. The result of this measure was the act (1 Will. IV. c. 25) for the regulation of the civil list. The sum of £510,000 was now granted to his majesty, and exclusively devoted to the privy purse, the salaries and expenses of the household, secret-service money, and pensions. The separate list for Ireland was discontinued, and the Scotch hereditary revenues and other items were directed to be paid into the Exchequer. The change was rather a new distribution, which enabled the country to look more closely into its expenditure, than a real reduction of the civil list.

On the accession of Queen Victoria, the C. L., which had long been of the nature of a compact between the monarch and the parliament, and as such beyond the control of parliament during the life of the sovereign, was settled by 1 and 2 Vict. c. 2. The Queen surrendered the hereditary revenues of the crown for life, in consideration of a yearly sum of £385,000, to be devoted solely to the support of her Majesty's household and the honour and dignity of the crown. The application of this sum to the particular branches of the Queen's privy purse, the salaries and expenses of the household, the royal bounty, alms and special services, is intrusted to the Lords of the Treasury; and it is provided that if the C. L. charges in any one year shall exceed the total sum of £400,000, an account of the particulars of excess shall be laid before parliament in thirty days. Besides the above sum, £1200 a year is intrusted to her Majesty for the payment of pensions, 'to persons who have just claims on the royal beneficence, or who, by their personal services to the crown, by the performance of duties to the public, or by their useful discoveries in science, and attainments in literature and the arts, have merited the gracious consideration of their sovereign and the gratitude of their country.'

**CIVIL SE'RVICE** is a general name for all the duties rendered to and paid for by the state, other than those relating to naval and military matters. At the head of the C. S. are placed the officers of the royal household, under several departments. Then come the officers of the House of Lords and the House of Commons. Then a vast number of offices or departments, of which we can only name the more important: Treasury, Home Office, Foreign Office, Colonial Office, India Office, War Office, Admiralty, Board of Trade, Post Office, Customs, Excise, Exchequer Office, National Debt Office, Office of Woods and Forests, Office of Works and Buildings, Duchy of Lancaster, Duchy of Cornwall, Record Office, Poor-law Board, Registrar-general's Office, Stationery Office, Ecclesiastical Commission, Charity Commission, Patent Office, Land and Emigration Office, Trinity House, Heralds' College, Law and Equity Courts, Ecclesiastical and Admiralty Courts, Criminal and Police Courts, Prison Department, British Museum, Diplomatic Corps, Consular Corps. The C. S. relating exclusively to Scotland and Ireland, forms two distinct lists, not included in the above.

The general designations for the civil servants of the crown are *commissioners*, *secretaries*, and *clerks*. There are others, but these are the principal. Nearly all enter the service as clerks, on salaries commencing at about £80 per annum; and they rise chiefly by seniority. It is usual to consider as belonging to the C. S. those who receive annual salaries, whose chief occupation is writing, whose provision for life is pretty well assured, who have a fair chance of promotion as they grow older, and who may look forward to a superannuation pension in their old age. The class does not include men of humbler attainments and position, such as policemen and postmen, and others paid weekly wages: these are civil servants of the crown, it is true, but they come under a different category. The *Civil Service List* for 1860 contains the names of about 15,000 persons, all of whom are said to possess 'situations under government.'

Until within the last few years, first appointments to the government offices were obtained mostly by favour; but now, merit and abilities are conditions superadded. By an Order in Council, dated May 21, 1855, the whole system was placed on a new basis. A C. S. Commission was appointed to examine all candidates for the service. A candidate being *nominated*, the commissioners in due time notify that he must come up to be examined. He sends in certificates of birth, health, and character. He is examined; and if he stands this test well, he is *certified*. The heads of the several departments agree with the commissioners as to the kind of test to which aspirants ought to be subjected. If the candidate fails at the first examination, he is generally allowed another chance, and sometimes a third. When the candidate has received his certificate, he enters one of the public offices, and goes through a six months' probation; if successfully, then he becomes a government clerk—or whatever it may be—at a definite salary. The commissioners can neither nominate nor appoint; they can only examine, and notify the result of the examination. Most of the nominations, and afterwards the appointments, are made by the heads of the several departments—with this exception, that the Treasury has a vast preponderance of the privilege, usually exercised by the parliamentary secretary for the time being. Some of the candidates go up for examination for any office that may offer, without special reference to any one in particular; while others present themselves for a *competitive* examination for some particular office or clerkship. See EXAMINATION. On one occasion (in 1860), 33 persons competed for 9 clerkships in the War Office, and 57 for 20 in the Customs. The age at which the candidate is admitted is, at most of the offices, between 18 and 25. The heads of departments may make occasional appointments without a certificate from the commissioners; but this can only be done under special circumstances, and for a special kind of service.

From the commencement of the new system in 1855 down to the close of 1860, the total number of nominations was about 14,000. Of these persons, some never went up for examination; some failed in reference to health or moral character; some through intellectual or educational deficiencies; some, though eligible, were defeated by others at competitive examinations; and some broke down during probation. Of those who passed through all the stages of the ordeal, the greater number have received appointments, and the rest are waiting for new openings. The C. S. has been rendered more attractive by a liberal system of superannuation, introduced by act of parliament in 1859. On retirement from the service, the servant of the crown receives a pension for the rest of his life, varying, according to the number of years he may have served, from one-sixth to four-sixths of the rate of salary he had last received.

The more important departments of the C. S. will be found briefly described under their proper headings in this work.

**CIVIL SERVICE E'STIMATES** include all expenses of the state not provided for in the Army and Navy Estimates. As an example of these C. S. E., we will quote the amounts voted under their various heads for the financial year beginning April 1, 1860, and ending March 31, 1861:

| | |
|---|---|
| Public works and buildings, . . . . . | £622,000 |
| Salaries and expenses of public departments, . | 1,414,000 |
| Law and justice, . . . . . . | 2,565,000 |
| Education, science, and art, . . . . | 1,306,000 |
| Colonial and consular services, . . . . | 484,000 |
| Superannuation and retired allowances, and gratuities, | 254,000 |
| Miscellaneous and special, . . . . . | 723,000 |
| | £7,368,000 |

**CIVI'LIAN.** This term has three meanings, which are distinct, though intimately related. 1. In a popular sense, it signifies a person whose pursuits are civil; i. e., neither military nor clerical. 2. As a law-term, it means, either a person who is versed in the principles and rules in accordance with which civil rights may be freely, blamelessly, and successfully vindicated in society generally, or in the particular state to which he belongs—or 3. One who has made a special study of these rules and principles as exhibited in the laws and government of Rome (the Roman civil law). The civil law of Rome exercised such influence upon the formation of the municipal systems of almost all the states of modern Europe, that those who devoted themselves to its study were regarded as 'civil' or municipal lawyers *par excellence*. From the more learned training which this study demanded, C. came often to be used as synonymous with professor or doctor, as opposed to practitioner of law; the former being generally more deeply versed in the Roman law than the latter; and this in its turn led to its being loosely applied to the international lawyers of the 17th c. (Grotius, Puffendorf, &c.), who generally belonged to the class of civilians in the sense of Romanists, and who, though their subject was altogether different, quoted largely and derived many analogies from the Roman jurisprudence. At present, from our having in Great Britain no class of persons who prosecute law as a *science* as opposed to an *art*, the term C. has reverted to its narrower medieval sense of student or teacher of the Roman civil law, and thus we speak of Savigny as a C., but not of Story. The special sense in which C. is understood in England will be explained under ECCLESIASTICAL COURTS. See also ADMIRALTY COURTS.

**CIVILISA'TION.** This is a general term to designate the condition of the more advanced nations, as contrasted with those that are looked upon as barbarians or savages. We term the leading nations of Europe civilised; the Chinese and Tartars less so; the Red Indians, Australians, Esquimaux, least of all. 'Whatever be the characteristics of what we call savage life, the contrary of these, or the qualities which society puts on as it throws off these, constitute civilisation. Thus, a savage tribe consists of a handful of individuals, wandering or thinly scattered over a vast tract of country; a dense population, therefore, dwelling in fixed habitations, and largely collected together in towns and villages, we term civilised. In savage communities, each person shifts for himself: except in war—and even then very imperfectly—we seldom see any joint operations carried on by the union of many; nor do savages, in general, find much pleasure in each other's society. Whenever, therefore, we find human beings acting together for common purposes in large bodies, and enjoying the pleasures of social intercourse, we term them civilised.' And so of other characteristics. *Dissertations* by J. S. Mill, art. 'Civilisation.'

When we come to seek for an exact definition of the term C., we meet with a variety of views, implying that there is a certain complication in the subject. The original derivation of the word points to that polish of manners that distinguishes the inhabitants of cities (Lat. *cives*) from the rustic population; but the use of the word has greatly outgrown this limitation. Guizot has given a definition, which has become generally known, to the effect that we are to include in C. the improvement of man both socially and in his individual capacity. But the chief difficulty lies in settling what is *improvement*. That people are far from agreed on this point is evident from the use of the phrase, 'vices of civilisation.' How are we to distinguish its vices from its virtues?

The question is very much simplified by making a distinction between *aiming at* the improvement of mankind and really *effecting* that object. All our inventions and discoveries, and all our new arrangements introduced into every department of life, are intended to raise us further and further above the savage condition; nobody denies this; but there may be the widest difference of opinion as to whether any one new device is a real improvement. If we were to restrict the term C. to the changes introduced into human life *with a view* to improvement, the definition of it would present no difficulty; whereas the relation of this to *progress*, or actual improvement, must ever remain open to difference of opinion.

Leaving out of view for the present the disputable matter, C. may be explained as follows: In the first place, there are certain things bearing decidedly on human preservation and human happiness that are to be excluded from the definition. C. is *not* natural advantages—such as those of soil and climate; or the goodness of the mental or bodily constitution of the race; or accidents of fortune favouring our exertions; or individual dexterity or skill that cannot be imparted. It is not necessarily happiness, which is sometimes present in a low C. and absent in a high. *The permanent changes in the condition and arrangements of man's life effected by his own intelligence and exertions* make up human civilisation. It is the *artificial* half of the good we enjoy. Nature has given us so much; our own powers of contrivance give the rest. Genius (in the sense of intellectual originality) is the cause, and C. the effect.

Such being the general definition, the enumeration of the separate departments is the enumeration of the institutions of civilised life. These may be briefly summed up under the following heads:

1. The *Industrial Arts*, or the devices fallen upon for turning to advantage the material resources and agencies of the globe. Perhaps no one will be found to dispute that these constitute real improvements.

2. The *Government*, or system of political organisation. It is here that we are most forcibly convinced of the propriety of distinguishing C. from *absolute progress*, or the devices intended for improvement from actual improvement. Scarcely anything in the whole political system of Great Britain, for instance, has commanded unanimous approbation first and last; nearly all the changes have been carried against reluctant minorities, and every now and then voices are raised against institutions accounted by the mass of the nation the very bulwark of our national greatness; as, for example, the parliamentary control of the sovereign authority.

One aim of social reformers has been to make the necessary functions of government compatible with a larger and larger range of individual liberty. The majority of men call this state of things not merely an intended but a real improvement; not merely C., but progress. Still, there is never wanting a class of minds that see only the disadvantageous side of this and all other social innovations.

Connected with liberty, we may also notice the growth of humane sentiment in all classes, the governing power included. When we revert to the horrible punishments to which men were subjected in this country, not many generations since, not only for real crimes, but out of mere superstitious antipathies, as in the burning of witches, we are apt to feel ashamed of our own ancestors, and to congratulate ourselves on having our lot cast in a milder age.

3. The *Arts of Social Intercourse*, embracing the material machinery of conveyance and communication; and also what may be called the moral machinery, such as forms of procedure for regulating assemblies, and the minor courtesies of life.

4. The scheme of *Morality* established in a community appertains to their civilisation. But in this also, difference of opinion prevails, when we compare different countries and times. Morality, in fact, has always been more or less a part of *Religion*, which must also be viewed as an institution pertaining to civilised men, whether of their own invention or the result of supernatural communication. In any case, there is mixed up with every religion much that is purely human, and which may be judged of by its tendencies to promote human welfare, like any other arrangement of society. This being the subject of all others that men have most differed upon, no criterion of progress can be laid down, because none would be universally received. The unconverted pagans alive at the final establishment of Christianity, naturally believed that the human mind was thrown backward by that event.

5. *Science* is the least disputed of all the ingredients of civilisation.

6. *Literature* and the *Fine Arts* make part of the C. of mankind. They are a new class of pleasures, superadded to the gratifications of mere sense, and of a kind that can be partaken equally by a large number of people. Instead of rivalry and contention, which are inseparable from the struggle for food, money, or power, the Arts tend to sociability and good-fellowship. Every contribution to Architecture, Painting, Music, &c., is a result of human genius, and intended for human pleasure; but there is not the same unanimity in this case as in the former; for many kinds of art are objected to as corrupting the mind; and too great a devotion to Art, on the whole, is said to endanger the just balance of men's regards to the serious interests of life.

The above enumeration will amply shew how to define the term C., and of what parts the total is made up. It has also been made apparent that the point as to whether any invention be an item of genuine *progress*, is, and ought always to be, an open question. The inventions of original minds intended for placing us further and further from the savage condition, and having that effect, may often be accused of producing new evils, which other arrangements are called for to neutralise. See *Chambers's Papers for the People*, No. 4, 'Education of the Citizen.'

**CI'VITA CASTELLA'NA**, a town of Central Italy, about 30 miles north-east of Rome. It is a place of 4000 inhabitants, picturesquely situated on a plateau of volcanic tufa above the Rio Maggiore; has an old cathedral, and a citadel, now used as a prison. It is, however, chiefly remarkable on account of the vast number of its Etruscan remains. It occupies the site of the ancient *Falerium Vetus*, one of the 12 cities of the Etruscan League; and *Falerii Novi*, of which also there are many remains, stood about 4 miles to the north of Civita Castellana.

**CIVITA DI PE'NNÉ**, a town of Naples, in the province of Abruzzo Ultra I., situated on a commanding hill about 20 miles south-east of Teramo. It is an ancient place, having, under the name of *Pinna*, been the chief city of the Vestini; and some remains are still found here. The modern town, though containing some fine edifices, including the cathedral, is in general badly built. C. di P. is noted for its manufactory of silk-flowers. Pop. 10,000.

**CIVITA SAN-A'NGELO**, a town of Naples, in the province of Abruzzo Ultra I., situated near the Adriatic, about 25 miles south-east of Teramo. It has a population of 7000, and an active trade.

**CIVITA VE'CCHIA**, a town of Italy, in the Pontifical States, is situated on the Mediterranean, in lat. 42° 4′ N., long. 11° 45′ E. Its ancient name was *Centum Cellæ*. The harbour of C. V. is the best in the papal dominions, and was constructed by the Emperor Trajan; the town, indeed, owed its origin entirely to the port of this emperor, and hence it was also known as Portus Trajani. The harbour is formed by two artificial moles projecting into the sea, while a third constructed between the two serves to protect the harbour from the heavy sea; upon this third and outward mole there is a good lighthouse, some 80 feet above the level of the sea. Within the port, there is a small dock and an arsenal. The town of C. V. is small, and has no buildings of any note except a large church in the principal street. The streets are ill paved and narrow, and the inhabitants poor. Pop. about 10,000. It is a free port, and is regularly visited by steam-packets from Marseille, Leghorn, Naples, Genoa, Messina, and Malta; while the majority of travellers visiting Rome land here. It is famous among the modern Italians for its oysters, which are extremely small, but delicious to the taste.

**CIVITE'LLA DEL TRO'NTO**, a town of Naples, in the province of Abruzzo Ultra I., ten miles north of Teramo. It is situated on a rock, is fortified and defended by a strong castle. C. del T. is historically interesting as the place where, in 1053, Robert Guiscard and his Normans gained a complete victory over the forces of Pope Leo IX., and the Emperor Henry III. of Germany; and also for the siege it sustained in 1557 against the French and papal army under the Duke of Guise, who was finally forced to retreat. Pop. 6600.

**CLACKMA'NNAN**, the county town of Clackmannanshire, in the south part of the county, on the Devon, near its confluence with the Forth, 9 miles east of Stirling. It lies on ground rising 190 feet above the rich carse-land of the plain of the Forth, which is also rich in coal, iron, and limestone. C. was formerly a royal burgh, and is mentioned as such in the acts of parliament of James V. in 1540 and 1543. From a bull of Pope Celestine III., dated 1195, it appears that at this early date the church and its chapels, together with forty acres of land, belonged to the Abbey of Cambuskenneth. In 1330, King David Bruce resided at Clackmannan. In 1358—1359, King David II. confirmed to Sir Robert de Bruce the castle and barony of C., with the lands of Kennet and others; and from that period to the present, the Bruces have been proprietors in this parish. Pop. 1535.

**CLACKMA'NNANSHIRE**, the smallest county of Scotland, bounded N. and W. by Perthshire and the Ochil Hills; E. by Perthshire and Fifeshire; S. by the Forth, separating it from Stirlingshire. Its greatest dimension is 10 by 8 miles; area, 48 square miles. It chiefly consists of the valley of the North Devon, gently declining from the green Ochil Hills to the Forth. The Ochils consist of trap, especially amygdaloid, claystone, porphyry, and greenstone, and rise in Bencleugh (more properly, Benclach), 2352 feet, and Dunmyat, or Demyat, 1345. A ridge of high ground, with inferior soil, often resting on clay, runs west through the middle of C., between the very fertile alluvial lands resting on the coal-measures in the south, and the North Devon valley in the north, where the soil is loamy, and rests on gravel, and also on the coal-measures, which extend to the base of the Ochils. The chief minerals are ironstone, sandstone, greenstone, coal, limestone, silver, copper, antimony. The chief rivers are the North Devon, rising in the south of Perthshire, and the Black Devon, rising in the south-west of Fifeshire; both run west across C. into the Forth. The river Forth is navigable for vessels of 500 tons up to Alloa, at which port ships of 700 tons register have been built. In 1857, half the county was in crop, the chief crops being wheat, barley, and oats. The 'Hillfoots' have long been celebrated for their extensive woollen manufactures, chiefly in tartan shawls and plaids, and have become, more recently, favourably known in the production of tweeds. The district is likewise famed for its ale, there being seven breweries in the county. There are also three extensive distilleries. The county is favourably known for its manufacture of green glass bottles, earthenware, bricks and tiles, its timber trade, and ship-building. The chief exports are iron and coal. The rude columnar greenstone of Abbey Craig, near Stirling, has come into use for grinding flour, which it does nearly as well as the French burr-stones. C. contains four parishes. The chief towns are Clackmannan, the county town; Alloa, the most important place; and Dollar, noted for its endowed educational establishment. In 1851, pop. 22,951; churches, 22 (five Established, six Free, and four United Presbyterian); 42 schools, with 3569 scholars. C., with Kinross-shire, returns one member to parliament; but the county, it may be remarked, occupies the anomalous position of having parishes within its circumference politically—Alva in Stirlingshire, and Tulliallan and Culross in Perthshire—which it does not embrace judicially. In C. have been found Roman stone coffins, sepulchral vases, and numerous old Roman coins. The Marquis of Montrose, in 1645, burned Castle Campbell, now a noble ruin situated on a wild but easily accessible eminence, on the brow of a hill immediately behind Dollar. In C., George Meikle constructed, in 1787, the first effective thrashing-machine in Scotland.

**CLA'DIUM** (Gr. *clados*, a branch or twig), a genus of plants of the natural order *Cyperaceæ*, of which one species, *C. Mariscus*, is a native of Britain, particularly common in the bogs and fens of Cambridgeshire, where hundreds of acres are almost entirely covered with it. It is 3—5 feet high, with a rounded leafy stem, the keel and margins of the leaves rough and almost prickly. It is consequently hurtful to cattle. It is used for thatching, and in Cambridgeshire also for lighting fires. The English name Twig-rush has been given to it, but is only of recent invention.

**CLAIM**, in English Law, is a challenge of interest in anything that is in the possession of another, or at least out of a man's own possession. Claims are either verbal or by action, and relate either to lands or to goods and chattels; their object being generally to preserve a title which otherwise would be in danger of being lost.

**CLAIM OF LIBERTY** is a suit or petition to the Queen in the Court of Exchequer, to have liberties and franchises confirmed there by the attorney-general (Tomlins' *Law Dic.*).

**CLAIR**, St, a river of North America, being that part of the St Lawrence, in its largest sense, which carries into Lake St Clair the waters of Lake Huron. It is 30 miles long, and half a mile broad, and easily navigable, its depth being 50 feet. Lake St Clair measures 30 miles in length by 12 in average width, and communicates at its south-west end with Lake Erie by means of the Detroit.

**CLAIRAC**, a town of France, in the department of Lot-et-Garonne, situated on the Lot, about 16 miles north-west of Agen. It has flour and paper mills, and a considerable trade. C. is chiefly interesting, however, as the first place in the south of France that embraced the doctrines of the Reformation, which it did in 1527, on the example of its abbot, Gerard Rouselle. It was the scene of frequent contests between Roman Catholics and Huguenots. Pop. about 3000.

**CLAIRAUT**, Alexis Claude, an eminent French mathematician, was born at Paris, May 7, 1713. He early exhibited a most remarkable aptitude for mathematics, and was considered worthy of admission to the Academy of Sciences, while as yet he was only 18 years of age. C. wrote a great number of scientific papers, but his fame now rests principally upon his *Figure of the Earth*, in which he promulgated the theorem, that the variation of gravity on the surface of the earth, regarded as an elliptic spheroid, was altogether independent of the law of density, the opposite opinion having been previously held; on his explanation of the motion of the lunar apogee, a point left unexplained by Newton; and on his computation of the time of the return of Halley's comet. He died at Paris, May 17, 1765.

**CLAIRE**, St, or *Santa Clara*, was born in 1193, of a rich and noble family of Assisi, in the duchy of Spoletto. Attracted by the eloquence and piety of St Francis of Assisi, she abandoned the pleasures of social life, in which she had previously indulged, and betook herself to solitude, prayer, and mystic meditation. Her imagination, excited by religious emotions, deceived her into the belief that she was in more direct communication with God than her fellow-mortals; and taking her own desires for divine intimations, she founded an order of nuns in 1212, and after obtaining a great reputation for sanctity, died at Assisi, August 11, 1253. Two years afterwards, she was canonised by Alexander IV.

**CLAIRE**, St, Nuns of the Order of, a religious order founded by St Claire, with the counsel and help of St Francis of Assisi, in 1212. At first, the nuns observed the rule of St Benedict, but in 1224 the austerity of this rule was mitigated by St Francis, and again modified by Urban IV. in 1264. Those who follow the rule as modified by Urban, are called *Urbanists;* the other and austerer portion of the sisterhood, *Damianists.* The order rapidly increased; and convents are numerous to the present day in Italy, France, Belgium, Bavaria, Asia, and America. The nuns devote themselves chiefly to the education of the young.

**CLAIRVAUX**, a village in the department of Aube, about ten miles above Bar-sur-Aube, on the left bank of the river, is remarkable as the site of the once famous Cistercian Abbey (Clara Vallis), founded in 1114 by St Bernard, who presided over it till his death in 1153, when he was buried in the church. Besides the original buildings, a new and splendid convent was afterwards erected, and a church which was reckoned a masterpiece of architecture, but was destroyed at the Restoration. There was shewn in the convent a monster cask, called 'St Bernard,' which contained 800 tuns. The abbey, which had at one time a revenue of 120,000 livres, was suppressed at the Revolution, and the extensive buildings are now used as a workhouse and house of correction.

**CLAIRVOY'ANCE.** See Somnambulism.

**CLAM.** See Chama.

**CLAM**, in Heraldry, is a term for an escalop or cockleshell, and is supposed to indicate that the bearer has been a crusader, or has made long voyages by sea.

**CLAM, BEAR'S PAW** (*Hippopus maculatus*), a bivalve mollusk of the South Seas, of the family *Tridacnidæ*. The shell is described as 'perhaps the most beautiful of bivalves, whether in regard to form, texture, or colour.' It is therefore a favourite shell for ornamental purposes. It is transversely ovate, ventricose, ribbed, roughened with scaly inequalities, white, and spotted with red or purple.

**CLAN** (Gael. *clann*, Manx *cloan*, meaning 'children,' i. e., descendants of a common ancestor). This word became incorporated with the English language at least as early as the 17th c., to mean a body of men confederated together by common ancestry or any other tie, and in this sense it is used both by Milton and Dryden. It came to be applied almost exclusively to the several communities of the Scottish Highlanders, as divided from each other topographically and by distinctive surnames. The word has sometimes been applied to those great Irish septs which at one time were a sort of separate states; but these, with their characteristic forms of internal government, were completely broken down by the power of the English predominance, before the word came into familiar use in the English language. In Scotland, it was used in the 16th c. to designate the freebooters of the border as well as to the Celtic tribes of the Highlands; and there were two characteristics common to both—their predatory habits, and their distribution into communities, each with a common surname. In the act of the Scottish parliament of 1587, for instance, which requires landlords to find security for the conduct of their tenants, it is provided that those 'who have their lands lying in far highlands or borders, they making residence themselves in the inlands, and their tenants and inhabitants of their lands being of clans, or dependars on chieftains or the captains of the clans, whom the landlords are noways able to command, but only get their mails (or rents) of them, and no other service or obedience, shall noways be subject to this act but in manner following.' Then follow provisions for enforcing the law directly on the chieftains or captains of those clans residing in territories where the owner of the soil—generally the merely nominal owner, in terms of some useless charter—had no control. It was always the policy of the old law of Scotland to require all the Highland clans to have some respectable representative—a man of rank and substance, if possible—who should be security at court for their good conduct. Clans that could find no security were called 'broken clans,' and their members were outlaws, who might be hunted down like wild beasts. The Macgregors were a celebrated broken C., whom the law pursued for centuries with savage ingenuity. Among other inflictions, their name was proscribed, and such members of the C. as endeavoured to live by peaceful industry in the Lowlands, adopted derivations from it; hence we have the names of Gregor, Gregory, and Gregorson or Grierson. The clans are never treated in the old Scots acts with any respect, or otherwise than as nests of thieves and cut-throats. The following passage in the act of 1581 (c. 112), which virtually authorises any Lowlander, injured by any member of a C., to take vengeance against all or any of his clansmen, contains a picturesque, though, for a legislative enactment, certainly a very highly coloured account of the social condition of the Highland clans in the 16th century. 'The saids clans of thieves for the most part are companies of wicked men, coupled in wickedness by occasion of their surnames or near dwellings together, or through keeping society in theft or receipt of theft, not subjected to the ordinar course of justice, nor to ony ane landlord that will make them answerable to the laws, but commonly dwelling on sundry men's lands against the good-will of their landlords, wherethrough true men oppressed by them can have no remeid at the hands of their masters, but for their defence are oftentimes constrained to seek redress of their skaiths of the hail clan, or such of them as they happen to apprehend. Likewise the hail clan commonly bears feud for the hurt received by any member thereof, whether by execution of laws, or order of justice, or otherwise.' The Highland clans are often carelessly spoken of as a feudal institution, but in reality their distinctive character cannot be better understood than by keeping in view some peculiarities which set them in complete contrast with the feudal institutions of Britain. All feudality has a relation to land, from the serf bound to the soil through the free vassal who possesses it, up to the superior or feudal lord, who commands services out of it. The descent to all rights connected with it is hereditary. Among the Highlanders, on the other hand, the relation was patriarchal, and had no connection with the land, save as the common dwelling-place of the tribe. It often happened, as the acts above quoted explain, that the head of a C. and the owner, according to feudal law, of the estates occupied by it, were two different persons. Clans did not acknowledge the purely feudal hereditary principle, and would elevate to the chiefship a brother or an uncle, in preference to the son of a deceased chief. It is a curious illustration of this, that in the rebellion of 1715, the notorious Lord Lovat, who had just returned from France, being acknowledged by the C. Fraser as their chief, drew them away from the rebel army, to which the proprietor of the Fraser estates had endeavoured to attach them, and arrayed them on the government side.

**CLAN MACDU'FF, LAW OF,** was a privilege of immunity for homicide anciently enjoyed by those who could claim kindred with Macduff, Earl of Fife, within the ninth degree. Macduff's cross stood on the march or boundary between Fife and Strathearn, above Newburgh; and any homicide possessed of the right of clanship who could reach it, and who gave nine kye (cows) and a colpindash (or young cow), was free of the slaughter committed by him. (Bell's *Dictionary*).

**CLANDE'STINE MA'RRIAGE.** A marriage contracted without the due observance of ecclesiastical ceremonies, even where concealment was not the chief or only object of the parties, is generally called a clandestine marriage. But, in Scotland, a distinction is made between marriages which are clandestine, and those which are simply irregular. All marriages which are not celebrated by a clergyman after proclamation of bans are irregular, and such of these irregular marriages as are entered into before a person professing to act as a religious celebrator, without being a minister of religion, are clandestine, and expose the parties, the celebrator, and witnesses to certain penalties. These penalties may be recovered before justices of the peace, on complaint by the fiscal; and the proceeding is not without some advantage to the parties, as the conviction is received as evidence of the marriage. In the eye of the law, clandestine and irregular marriages in Scotland are as valid as those in the face of the church, provided they be of such a kind as to establish the consent of the parties to become man and wife in point of fact. But, notwithstanding the existence of this rule of the civil law, marriages in Scotland, in any other form than *in facie ecclesiæ*, are practically of very rare occurrence; and Dr Lushington shewed little acquaintance with the social condition of that country when he stated, before a select committee of the House of Commons, in 1849, that it was 'rarely that Scotch marriages took place in the face of the church, at least not very often, so far as he knew.' In order to put a stop to Englishmen crossing the border, merely in order to celebrate irregular marriages, it was enacted by 19 and 20 Vict. c. 96, 'that after the 31st December 1856, no irregular marriage shall be valid in Scotland, unless one of the parties has lived in Scotland for the 21 days next preceding the marriage, or has his or her usual residence there at the time.' It is further enacted, that the parties to such a marriage may apply within three months, *jointly*, to the sheriff or sheriff-substitute of the county, for a warrant to register it. Upon proof that one of them had lived for 21 days, or usually resided in Scotland, and that they have contracted marriage, the sheriff is to grant a warrant to the registrar of the parish to record the marriage. A certified copy of the entry, signed by the registrar, which he must give for 5s., is declared to be evidence of a valid marriage.

**CLANDESTINE MORTGAGE**, in England, is a second mortgage of lands, already mortgaged for a valuable consideration, the first mortgage being concealed, or not discovered in writing to the second mortgagee. It is provided by 4 and 5 Will. and Mary, c. 16, that in such circumstances the mortgager, or person so mortgaging his lands, shall have no relief, or equity of redemption, against the second mortgagee.

**CLA'P-NET**, a kind of ground-net much used by the bird-catchers of the south of England, who supply the London market. It consists of two equal parts or sides, each about twelve yards long, by two yards and a half wide, and each having a slight frame. These are placed parallel to one another, fully four yards apart, and by an ingenious contrivance, the pulling of a string is made to close them upon one another, so as to cover the oblong space between them. Call-birds, either in small cages, or fixed by braces, are placed about the net to decoy wild birds to the spot.

**CLA'PPERTON, HUGH**, one of those British travellers that led the way in exploring the interior of Africa, was born at Annan, in the county of Dumfries, Scotland, in 1788. At the age of 17, he went to sea; and being impressed into a man-of-war, he distinguished himself by his services, and was appointed to the rank of lieutenant. In 1817, he returned to England on half-pay. Having become acquainted in Edinburgh with Dr Oudney, who was about to proceed to Bornu as British consul, the thoughts of C. were directed to Africa; and government appointed him and Lieutenant Denham to accompany Oudney in an exploring expedition into the interior of that continent. After a short stay at Tripoli, they started in February 1822 for Bornu, where Denham separated from his companions, in order to carry his researches southward. C. proceeded westward, accompanied by Oudney, who died by the way. He still pushed on alone as far as Sakkatu, but not being allowed to proceed further westward, he retraced his steps, and, in company with Denham, returned to England in 1825. The journey had done much for the knowledge of Africa, but the great geographical problem of the course of the Niger was still much in the same position. To solve it, if possible, C.—the rank of commander having been conferred upon him—started again in August 1825, in company with Captain Pearce, R.N., Mr Dickson, and Dr Morrison. He had also Richard Lander as his confidential servant. They commenced their exploration into the interior from the Bight of Benin. His companions died early on the journey, but C. and his faithful attendant Lander reached Sakkatu. Detained here by the Sultan Bello, the vexation joined to the hardships of the journey so affected his health, that he died at Changary, near Sakkatu, April 13, 1827. C. was the first European that penetrated from the Bight of Benin into the interior of Africa, and followed the course of the Niger for a great way. Though without scientific education, he was an intelligent and unprejudiced observer, and made important additions to geographical knowledge.—*Narrative of Travels and Discoveries in Northern and Central Africa in the years* 1822, 1823, *and* 1824, *by Denham, Clapperton, and Oudney* (Lond. 1826); *Journal of a Second Expedition into the Interior of Africa*, &c. (Lond. 1829); *Records of Clapperton's Last Expedition to Africa*, by Richard Lander (Lond. 1830).

**CLAQUE** (from Fr. *claquer*, 'to clap the hands,' or 'applaud') is the name given to a contrivance for securing the success of a public performance or production, by bestowing upon it preconcerted applause, and thus giving the public, who are not in the secret, a false notion of the impression it has made. This artifice came first into operation in theatres and concert-rooms, and arose from friendly or party motives; but it is to be feared that it has spread into other departments of public life, not excepting even parliaments.

It was in Paris that it was first regularly organised and turned into a trade. One Sauton, in 1820, established an Office for the Insurance of Dramatic Success (Assurance des Succès Dramatiques), and was thus the organiser of the Parisian 'claque.' The directors or managers of a theatre send an order to the Office for whatever number of 'claqueurs' they think necessary. If the success of a piece seems doubtful, as many sometimes as from 300 to 500 of these people are furnished with gratis tickets, and are often instructed at the rehearsals at what particular places they are specially to applaud. How minutely the art is organised, may be seen from the exact division of functions among the several claqueurs. The 'commissar' is bound to learn the play by heart, and call the attention of the audience about him to the various beauties of the piece; the 'rieur' must laugh at every jest; the 'pleureur' (weeper) has to manifest his sensibility at the moving passages. This last part is generally assigned to women, in whom the frequent use of the handkerchief seems most natural. The 'chatouilleur' (tickler), on the other hand, endeavours, by distributing bonbons, snuff, theatre-bills, &c., and by lively conversation, to keep his neighbours in good-humour; and lastly, the 'bisseur' calls *encore!* with the utmost enthusiasm, at the conclusion of the specified pieces of music.

The following incident, which found its way into the newspapers on the occasion of the death of the famous French actress, Mademoiselle Rachel, shews the ludicrous seriousness with which the members of the C. view their singular profession: Mademoiselle Rachel had just created a new character in a modern piece, and during the first evening, was loudly applauded. The next, however, she thought her reception by no means so warm, and she complained of it, adding that the C. did not do its duty. It turned out that the head of the C. had been ill, and that his place that evening had been supplied by a confrère from another theatre. This individual, on hearing of the complaint that had been made, wrote to mademoiselle as follows: 'MADEMOISELLE—I cannot remain under the obloquy of a reproach from such lips as yours! The following is an authentic statement of what really took place. At the first representation, I led the attack in person not less than thirty-three times. We had three acclamations, four hilarities, two thrilling movements, four renewals of applause, and two indefinite explosions. In fact, to such an extent did we carry our applause, that the occupants of the stalls were scandalised, and cried out, "*A la porte!*" My men were positively extenuated (?) with fatigue, and even intimated to me that they could not again go through such an evening. Seeing such to be the case, I applied for the manuscript, and after having profoundly studied the piece, I was obliged to make up my mind for the second representation to certain curtailments in the service of my men. I, however, applied them only to MM. ——, and if the *ad interim* office I hold affords me the opportunity, I will make them ample amends. In such a situation as that which I have just depicted, I have only to request you to believe firmly in my profound admiration and respectful zeal; and I venture to entreat you to have some consideration for the difficulties which environ me.'

A similar office is said to exist in London, in which theatrical artists and managers are obliged, by large sums, to insure success, or at least guard against factious opposition. Although no public offices of the kind have yet been established in Germany, the artifice is extensively practised, to the perversion of the public judgment and the detriment of art.

**CLARE**, a maritime county in the province of Munster, Ireland, bounded N. by Galway and Galway Bay; E. and S. by the Shannon, and its expansion Lough Derg, separating it from Tipperary, Limerick, and Kerry; W. by the Atlantic. It lies between lat. 52° 32′ and 53° 7′ N., and long. 8° 25′ and 9° 58′ W. It is seventh in size of the Irish counties; length, 67; greatest breadth, 38; average, 21; area, 1294 square miles—more than a half being arable, and a hundredth in wood. The surface is mostly hilly, with some mountains, bog, marsh, and rugged pasture. There is an undulating plain in the centre, from north to south. On the east, lie the Inchiquin, Slieve Baughta, and Slieve Barnagh mountains, the highest being 1758 feet, with rich pastures between. The mountains on the west rise in Mount Callan to 1282 feet. In the south, along the rivers, are rich loamy pastures called corcasses. The coast-line is 140 miles along the sea, and 80 along the Shannon estuary. The sea-line is high and rocky, in parts precipitous, with many isles and fantastic detached rocks. For five miles at Moher, the coast rises 400 feet nearly perpendicular, and at another point 587 feet. The chief rivers are the Shannon (q. v.), and the Fergus, running south 27 miles through the middle plain, and by an estuary five miles broad. The county has about 100 small lakes. Carboniferous limestone is a prevailing formation in the county. The south-west third of the county forms part of the Munster coal-field, with beds of ironstone, and thin seams of coal and culm. C. has mines of lead, copper pyrites, and manganese; slate and flag quarries; a black marble quarry near Ennis; and many chalybeate springs. The soils are warm and friable on limestone, deep rich loam on the Shannon, and cold and wet, with bogs and much timber, on the coal tracts. The limestone tracts contain underground fissures, through which streams pass from lake to lake, and rise to the surface, forming winter lakes or pools. These tracts afford rich pasture in the summer, when the water dries up. In some places, spring-water is very scarce, and water can only be procured from the neighbouring corcasses. The climate is moist and mild. There are frequent violent gales from the Atlantic, which incline trees to the east, even 60 miles inland. In 1858, above a fourth of the county was in crop, the chief crops being oats, potatoes, wheat, and barley. The chief trade is in grain and provisions. Fine sheep and cattle are reared on the pastures. Fish are caught on the rivers in the native wicker-boats. The chief manufactures are coarse linens, hosiery, flannels, and friezes. C. is divided into 11 baronies, 80 parishes, and 7 poor-law unions, with parts of 3 others. The chief towns are Ennis (the county town), Kilrush, Ennistymon, and Killaloe. Pop. in 1841, 286,394; in 1851, 212,428. In 1851, C. possessed 130 national schools, with 17,233 scholars. It returns three members to parliament, two for the county, and one for Ennis. C. has many cromlechs, raths, remains of abbeys, and old castles or towers, and several round towers, one at Kilrush being 120 feet high. C., till the time of Elizabeth, was called Thomond. An adventurer called Clare gave it its present name.

**CLARE COLLEGE**, Cambridge, founded 1326, under the name of University Hall, by Richard Badew, was burned down in 1338, and rebuilt and endowed by Elizabeth, Countess of Clare. Chaucer calls this college 'Solere' Hall. There are at present 10 senior, 9 junior, and 3 bye fellows, the last having no share in the government of the college. The master is elected by the senior and junior fellows. The buildings of this college, which are in the renaissance style, are amongst the most pleasing in the university. Richard III., pretending himself to be descended from the foundress, claimed the patronage of this Hall. The chapel was not built till 1535, previous to which an aisle of St Edward's Church, where the masters and fellows were anciently interred, was used for the purpose.

**CLARE ISLAND**, an island of Ireland, belonging to the county of Mayo, situated in the Atlantic, at the entrance of Clew Bay. It has a length of 4½ miles, with a breadth of 2 miles. On its north-east extremity, there is a light-house at an elevation of 487 feet above the sea. Lat. 53° 49′ 30″ N., long. 9° 55′ 30″ W.

**CLA'REMONT**, a mansion or country-seat at Esher, Surrey, built by a noble family of that name. When the Princess Charlotte, heiress-apparent to the crown of England, was married to Prince Leopold of Saxe-Coburg, C. was assigned as their residence; and at the death of the princess in 1817, the use of it was continued to the widower for life, along with the allowance settled on him of £50,000. The prince lived here till his election as king of Belgium, since which time he has only occasionally visited it. After the revolution of February 1848, he placed it at the disposal of his father-in-law, ex-king Louis Philippe, who inhabited it till his death in August 1850, and whose family have since continued to reside there. C. has been to the younger line of the House of Bourbon what Frohsdorf is to the elder, and has been the scene of more than one congress of the leading Orleanists.

**CLA'RENCIEUX**, the first of the two provincial Kings-of-Arms, in England, the second being Norroy. The jurisdiction of C. extends to all England south of the Trent, that of Norroy (q. v.) comprehending the portion north of that river. C. is named after the Duke of Clarence, third son of King Edward III. It is his duty to visit his province, to survey the arms of all persons bearing coat-armour within it, to register descents and marriages, and to marshal the funerals of all persons who are not under the direction of *Garter*. He also grants arms within his province, with the approval of the Earl Marshal.

**CLA'RENDON**, Constitutions of, were laws made by a parliament, or rather by a general council of the nobility and prelates, held at Clarendon, a village in Wiltshire, in 1164, whereby King Henry II.

checked the power of the church, and greatly narrowed the total exemption which the clergy had claimed from the jurisdiction of the secular magistrate. These famous ordinances, 16 in number, defined the limits of the patronage, as well as of the jurisdiction, of the pope in England, and provided that the crown should be entitled to interfere in the election to all vacant offices and dignities in the church. The constitutions were unanimously adopted, and Becket, the primate, reluctantly signed them, at the solicitation of his brethren. But they were at once rejected by Pope Alexander III., when sent to him for ratification, and Becket thereupon immediately retracted his consent, and imposed upon himself the severest penances for his weakness in giving it. This, and the other measures adopted by the haughty and imperious archbishop, to vindicate the independence of his order, led to the unhappy disputes between him and the monarch, which terminated in the famous tragedy at Canterbury, commonly known as the *martyrdom* of St Thomas-à-Becket, the canonisation of the saint, and the pilgrimages to his tomb, which subsequently became an institution of the Roman Catholic Church. Notwithstanding the personal humiliation to which Henry submitted after Becket's death, most of the provisions of the constitutions of C. continued to be permanent gains to the civil power. A masterly and dispassionate appreciation of the constitutions of C., and of the motives by which Henry and Becket were actuated, in the famous controversy of which they were the personal representatives, will be found in Dr Pauli's *Geschichte v. England.*

**CLARENDON**, Edward Hyde, Earl of, an English historian and statesman, son of a private gentleman, was born at Dinton, Wiltshire, 18th February 1608, and educated at Oxford. He studied law under his uncle, Nicholas Hyde, Chief-justice of the King's Bench; was a member of the Long Parliament, and for some time spoke and voted on the side of the popular party; but on the breaking out of the civil wars in England, he attached himself to the royal cause, and in 1642 was appointed Chancellor of the Exchequer, knighted, and sworn of the privy council. Accompanying Prince Charles (Charles II.) to Jersey, he remained there for two years, and began his *History of the Rebellion* (London, 1702—1704; continuation, with Life, 1759), and also wrote the various papers which appeared in the king's name, as answers to the manifestoes of the parliament, and which far surpassed in vigour and elegance the productions against which they were directed. In May 1648, he went to Paris, and in November 1649, was sent on an unsuccessful mission for assistance from the Spanish court. He afterwards proceeded to the Hague, where, in 1657, Charles II. appointed him High Chancellor of England. At the Restoration, he was confirmed in that office, and elected chancellor of the university of Oxford. In November 1660, he was created Baron Hyde, and in April following, Viscount Cornbury, and Earl of Clarendon. In 1663, the Earl of Bristol accused him of high treason in the House of Lords; and though this charge failed, public indignation was excited against him by the ill success of the war with Holland, and the sale of Dunkirk to the French. The victim also of some court intrigues, he was deprived of his offices; and he secretly withdrew to Calais, whence he sent his Apology to the Lords; but this writing was ordered, by both Houses of parliament, to be burned by the common hangman. After living six years in exile, he died at Rouen, December 1674, and was buried in Westminster Abbey. His daughter, Anne Hyde, became the wife, in 1659, of the Duke of York, afterwards James II., and was the mother of Anne and Mary, both queens of Great Britain.

C. was, on the whole, both well-intentioned and wise. There can be no doubt that he loved his country sincerely, and was humanely and liberally disposed. He was too moderate for the troublous times in which he lived. Lacking enthusiasm, he failed to appreciate the position of the Puritans; and after a brief period spent in their service, he passed over to the camp of the Royalists, but was never a bigoted partisan. His firmness, however, was not equal to his sagacity, and hence arose the perplexities which ultimately occasioned his fall. C.'s private character was excellent, in an age when virtue was utterly unfashionable among noblemen.

**CLARENDON**, George William Frederick Villiers, Earl of, a distinguished living statesman, was born 12th January 1800. He is a descendant of Thomas Villiers, who, in 1752, married the heiress of the last Lord Clarendon of the Hyde family, and was, in 1756, made Baron Hyde, and in 1776, Earl of Clarendon. Having studied at Cambridge, he early entered the diplomatic service, and in 1833 was appointed to the then important post of ambassador at Madrid, where he acquired great influence, which he employed in establishing the government of Spain on a constitutional basis. On the death of his uncle, the third earl, without issue, in 1838, he succeeded to the title, and returned to England to take his seat in the Upper House. In 1840, he was appointed keeper of the Great Seal. When the Whig ministry was broken up in 1841, he became an active member of the opposition; but warmly supported Sir Robert Peel in his measures for the abolition of the corn-laws. Under Lord John Russell's premiership, he became President of the Board of Trade in 1846, and the following year was appointed Lord-lieutenant of Ireland. He entered upon his duties in troublous times. The insurrectionary follies of Smith O'Brien and his coadjutors might have set the whole country in a blaze, but for the prompt and decisive measures which C. adopted, and which soon restored general tranquillity. At the same time, his tact and impartiality contributed to allay and reconcile the exasperations of party. The severity of his proceedings against the Orangemen on occasion of disturbances in 1849, was made the subject of a formal accusation in the House of Lords; but C. made a convincing defence, and ministers declared their complete approval of his proceedings. When the Russell cabinet resigned in 1852, C. was replaced by the Earl of Eglinton; but on the formation of the Aberdeen ministry, in a later part of the same year, he was intrusted with the seals of the Foreign Office. When Lord Palmerston became premier on the resignation of the Earl of Aberdeen in 1855, no change was made in the Foreign Department, and C. continued to hold the seals until the resignation of Palmerston in 1858, since which time he has remained out of office.

**CLA'RET** (Fr. *clairet*), a term originally applied to wines of a light-red colour, but which is now used in England as a general name for the red wines of Bordeaux (q. v.). The name as used in England is unknown in France.

**CLARIFICA'TION** is the process of clearing a fluid from a turbid condition, as in the case of Beer (q. v.), or in the action of gelatine in fining British wines. Natural waters containing much organic matter in mechanical suspension and in chemical solution, are clarified by the addition of a little alum, which is precipitated with the organic matter, and the water then becomes healthy and refreshing. Liquids are often clarified by straining through several layers of cloth; and the addition of cold water to hot coffee, &c., causes a deposit to be thrown down, which clears the solution. The use of the CLEARING NUT (q. v.), for clarifying water, is general in India.

**CLA'RINET, or CLA'RIONET**, a wind-instrument of the reed kind, invented by Joseph Christoph Denner, in Nürnberg, in 1690. Its tone is produced by a thin piece of Spanish reed nicely flattened, and tied, or otherwise fixed on the mouthpiece. On the body of the instrument there are holes and keys for the fingers of the performer, by which the notes are produced. In extent, fulness, and variety of tone, the C. is the most perfect of wind-instruments. Its construction, however, does not admit of every key in music being played on the same instrument, for which reason clarinets of different pitch are used in orchestral music—viz., the C C., which plays all the notes as they are written; the B flat C., a whole tone below the C; and the A C., a minor third below the C. In military music, an E flat C., a minor third above the C one, is much used.

**CLA'RION, or CLA'RIN**, a species of trumpet, more shrill in tone than the ordinary one, also the name of an organ-stop of four feet pitch.

**CLARK, SIR JAMES**, Bart., a distinguished physician, was born at Cullen, Banffshire, December 1788. His early education was obtained at the grammar-school of Fordyce; and he afterwards passed to King's College, Aberdeen, where he took the degree of M.A. He studied medicine at Edinburgh and London, and entered as a navy surgeon in 1809—a position he held until 1815. Taking his degree of M.D. in Edinburgh in 1817, he, after travelling on the continent, settled at Rome, where he practised as a physician for eight years. In 1826, he took up his residence in London, where he soon secured for himself a prominent place among the most eminent medical men of the time. On the accession of Queen Victoria to the throne, C., who for two years previously had acted as physician to the Duchess of Kent, was appointed physician in ordinary to her Majesty; and in that capacity he has attended the Queen on most of her journeys to Scotland and the continent. He was created a baronet in 1838. Among the most important of C.'s contributions to medical science, is his work *On the Sanative Influence of Climate*, a subject upon which he is considered a high authority; and *A Treatise on Pulmonary Consumption*, in which he shews that this destructive malady is one of the general health, depending upon mal-assimilation of the food, and to be prevented, and in certain cases arrested, by a wise regulation of food, air, and exercise. He was among the first in his profession, along with Dr Andrew Combe and Sir John Forbes, who demonstrated the importance of the study of the laws of health, in order to the salutary direction and control of morbid action in disease; and he has done great public and professional good by inculcating attention to the powers of recovery inherent in all living organisms. C. prefaced and edited the last edition of Dr Combe's *Management of Infancy*.

**CLARKE, ADAM**, LL.D., an eminent minister and scholar of the Wesleyan Methodists, was born about 1762 in the north of Ireland. He studied at Kingswood, near Bristol, and at the age of twenty, became a preacher or evangelist, in which capacity he obtained a great name, and seems to have exercised a most beneficial influence. Although the office of a Wesleyan pastor is very unfavourable for the development of scholarly habits, C. contrived to find time for extensive study. His first work was a *Bibliographical Dictionary*, published in 1802. His attainments in oriental literature and biblical knowledge procured for him the degree of LL.D. from St Andrews university. The Board of Commissioners on the Public Records selected him to edit Rymer's *Fœdera*. He also edited and abridged several other works, but the great work of his life was his edition of the Holy Scriptures in English, illustrated with a commentary and critical notes, into which were compressed all the results of his varied reading. The first volume appeared in 1810, the eighth and last in 1826. C. died August 26, 1832.

**CLARKE, EDWARD DANIEL**, known as a traveller and author, was born at Willingdon, in Sussex, in 1769. He studied at Cambridge, and from 1790 to 1799 was employed as tutor and travelling-companion in several noblemen's families, and made the tour of Great Britain, France, Italy, Switzerland, and Germany. In 1799, he set out on an extensive tour with Mr Cripps, a young man of fortune; they traversed Denmark, Norway, Sweden, Lapland, Finland, Russia, the country of the Don-Cossacks, Tartary, Asia Minor, Syria, Egypt, Greece, and did not return to England till 1802. In consequence of his donations to the university of Cambridge, C. received the degree of LL.D. In 1807, he began a course of lectures on mineralogy, and the university established a professorship of that science in his favour. He presented to the library of Cambridge a number of valuable marbles collected during his travels; among others, the colossal statue of the Eleusinian Ceres, on which he wrote a treatise in 1803. England is also indebted to him for the possession of the famous sarcophagus with the inscription in three languages. On this he wrote a treatise: *The Tomb of Alexander, a Dissertation on the Sarcophagus brought from Alexandria, and now in the British Museum* (Lond. 1805). His 'Travels,' of which the first volume was published in 1810, and the fifth in 1819, were received with extraordinary favour. An additional volume, containing his *Travels through Denmark, Sweden, Lapland, Norway, Finland, and Russia*, was published after his death (Lond. 1823). A complete edition of his travels appeared in 11 vols. (Lond. 1819—1824). The university of Cambridge purchased his Greek and oriental manuscripts, among which is the famous Codex of Plato, which C. discovered in the island of Patmos. C. died March 9, 1822.

**CLARKE, DR SAMUEL**, an eminent philosopher and theologian, was born at Norwich, October 11, 1675, and educated at Cambridge. The system of Descartes at that time held almost universal sway; but this failing to satisfy his mind, he adopted the views of his contemporary and friend Newton. Along with philosophy, he pursued the study of theology and philology. He was some time chaplain to the Bishop of Norwich, a promoter of science; he afterwards became chaplain to Queen Anne, and in 1709 rector of St James's. By his work on the Trinity (1712), in which he denied that that doctrine was held by the early church, he brought himself into considerable trouble. The convocation of bishops, who wished to avoid controversy, contented themselves with an explanation, anything but satisfactory, and a promise from C. to be silent for the future on that subject. His views were of the kind known as *Semi-Arian*. For the rest, C. was a vigorous antagonist of the freethinkers of his time; in opposition to Dodwell, he sought to demonstrate the immortality of the soul from the idea of an immaterial being. He died May 17, 1729. His most famous work is, *Demonstration of the Being and Attributes of God* (Lond. 1705); connected with it in subject is his *Verity and Certitude of Natural* *and Revealed Religion* (Lond. 1705). At the instigation of the Princess of Wales, who was inclined to the doctrines of Leibnitz, C. entered into a keen correspondence with that philosopher on space and time, and their relations to God, on moral freedom, &c. This correspondence was published under the title of *Collection of Papers which passed between Leibnitz and Clarke in the years* 1715 *and* 1716 (Lond. 1717). In his ethical disquisitions, he seeks to find a foundation for moral obligation in a peculiar principle, which he calls the *fitness of things*, or the relations of things established from eternity by God. He published a valuable edition of Cæsar (Lond. 1712); that of Homer (Lond. 1729—1746) was completed by his son. A collected edition of his philosophical works appeared in 4 vols., Lond. 1738—1742.

**CLARKSON**, THOMAS, an eminent philanthropist, the son of a clergyman, master of the Free Grammar-School at Wisbeach, Suffolk, was born in that town, March 28, 1760. He studied at Cambridge University, and was led to become the promoter of the anti-slavery agitation in Great Britain by a Latin prize-essay which he wrote in 1785, on the question, 'Is it right to make slaves of others against their will?' An English translation, on being published, had an extensive circulation, and C. resolved to devote his life to a crusade against African slavery. Associations were formed, and, besides visiting the principal towns of England, and even going to Paris, in the cause, C. published numerous essays, pamphlets, and reports on the subject. Mr Wilberforce, M.P., whose co-operation C. had secured, took the lead in the anti-slavery agitation, and in 1787 brought the subject before parliament. On March 25, 1807, the law for the suppression of the slave-trade passed the legislature, and C. subsequently wrote a *History of the Rise, Progress, and Accomplishment of the Abolition of the African Slave-trade*, 2 vols. 8vo, 1808. On the formation of the Anti-slavery Society, in 1823, for the abolition of slavery in the West Indies, C. became one of its leading members, and saw the object of its efforts attained in 1833. He took an active part in other benevolent schemes, particularly in the establishment of institutions for seamen in seaport towns, similar to the Sailors' Homes. He was in deacon's orders in the Church of England, but became a member of the Society of Friends. He died September 26, 1846.

**CLARY** (*Salvia sclarea*), a plant of the same genus with Sage (q. v.), a native of Italy and other southern countries of Europe, and which has been cultivated in British gardens from a very early period for its aromatic and other properties. It is a biennial, about 2 feet high, with clammy stem, large, heart-shaped, rough, and doubly crenate leaves, and whorls of pale-blue flowers in loose terminal spikes, with large coloured bracteæ. The seed is generally sown in spring, and the plants flower in the second year. C. is antispasmodic and stimulating. It has an odour resembling that of Balsam of Tolu, and is used for seasoning soups, and in confectionary for flavouring. Its flowers are used for making a fermented wine, esteemed for its flavour. —A British species of *Salvia* (*S. Verbenaca*) is sometimes called Wild Clary.

**CLA'SSICS.** The term *classici* was originally applied to those citizens of Rome that belonged to the first and most influential of the six classes into which Servius Tullius divided the population. As early as the 2d c. after Christ, it is applied figuratively by Gellius to writers of the highest rank, and this mode of designation has since been very generally adopted both in literature and art. Most nations have had at some one time a more than usual outburst of literature, and they usually style this the Classical period of their literature, and its most distinguished writers their Classics. But as the great productions of the writers and artists of antiquity have continued to be looked upon by moderns as models of perfection, the word C. has come to designate, in a narrower sense, the best writers of Greece and Rome, and 'classical' to mean much the same as 'ancient.'

**CLAUDE**, ST, a town of France, in the department of Jura, romantically situated at the confluence of the Bienne and Tacon, 25 miles south of Lons-le-Saulnier. The town originated in an abbey erected here in the 5th century. The abbey enjoyed extensive privileges, including a very oppressive one—viz., that a year's residence on the abbey-lands made a peasant a serf. Serfdom continued down to the Revolution. St C. has a fine cathedral, and manufactures of cotton and paper; and musical-boxes, snuff-boxes, toys, and fancy articles of horn, bone, &c., are largely made. Pop. 4920.

**CLAUDE LORRAINE** (properly named CLAUDE GELÉE), a celebrated landscape-painter, was a native of Lorraine, and born in 1600. A relative, who travelled as a lace-dealer, took C., when still a boy, to Italy, but deserted him in Rome. However, he soon found employment in grinding colours, and doing other menial services for Agostino Tassi, a landscape-painter, from whom he gained some knowledge of art. He next studied under Godfrey Waals at Naples, and after some time spent in wandering through various portions of Europe, he finally settled at Rome in 1627. The demand for his pictures rapidly increased, and he received numerous commissions. C. died of gout in 1682.

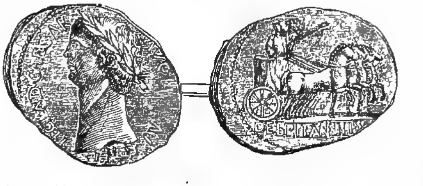
C.'s landscapes are found in the chief galleries of Italy, France, Spain, and Germany, and in particular England, which, according to Dr Waagen, contains 54 paintings by Claude. Four of his best works—the landscapes known as 'Morning,' 'Noon,' 'Evening,' and 'Twilight'—are in the royal gallery at St Petersburg. The painting on which C. himself set the highest value is the 'Villa Madama.' He kept it as a study, and refused to sell it, even when Pope Clement IX. offered for it as much gold coin as would cover the canvas. As C.'s paintings have always commanded very high prices, many copies and imitations have been imposed on buyers. This was the case even during the artist's lifetime; for he set high prices on his works. In order to stop the fraudulent trade carried on in his name, he collected the sketches of his pictures in a book, to which he gave the title *Liber Veritatis*. It is now in the library of the Duke of Devonshire.

C. was an earnest, indefatigable student of nature, and possessed great invention. No one could paint with greater beauty, brilliancy, and truth the effects of sunlight at various hours of the day, of wind on foliage, the dewy moistness of morning shadows, or the magical blending of faint and ever-fainter hues in the far horizon of an Italian sky; but it has been affirmed —especially of late—that his conception is often artificial, conventional, and positively untrue, and it must certainly be admitted that his introduction of pseudo-Greek architecture into modern scenery is in the very worst taste. His figures are in general such inferior accessories, that he was wont to say he made no charge for them when he sold his pictures. In his private character, C. was amiable and very generous.

**CLAUDET'S FOCI'METER**, an instrument for ascertaining the coincidence or non-coincidence of the chemical and visual foci in portrait or landscape combinations of lenses. It consists of eight fans or equal segments of a circle, arranged spirally round a horizontal axis; they are white, and numbered from one to eight with black figures, and when in use, are so placed as to be all seen together from the lens. The method usually adopted in testing a lens is, to focus with great accuracy the fan numbered 4, and take a photograph of the instrument, in which, if No. 4 be the sharpest and best defined, it is a proof of the coincidence of the chemical with the visual focus; if, however, No. 3 should be sharper, the lens has been under-corrected; if No. 5, the lens has been over-corrected; in the former case, the lens must be turned more towards the ground glass, and in the latter further from the ground glass.

**CLAUDIA'NUS**, CLAUDIUS, a Latin poet of Alexandria, lived in the end of the 4th and beginning of the 5th century. He wrote first in Greek, which appears to have been his native tongue (though he was originally of Roman extraction); but, as Gibbon says, he 'assumed in his mature age the familiar use and absolute command of the Latin language; soared above the heads of his feeble contemporaries; and placed himself, after an interval of 300 years, among the poets of ancient Rome.' His poems brought him into such reputation, that, at the request of the senate, the Emperors Arcadius and Honorius erected a statue in honour of him in the forum of Trajan. The productions of C. that have come down to us, consist of two epic poems, *The Rape of Proserpine*, and the incomplete *Battle of the Giants;* besides Panegyrics on Honorius, Idyls, Epigrams, and occasional poems. C. displays a brilliant fancy, rich colouring, with variety and distinctness in his pictures; but he is often deficient in taste and gracefulness. A good edition of his works was published by Gesner (Leip. 1759), more recently by Doullay (Paris, 1836). An English translation was executed by A. Hawkins (London, 2 vols. 1817).

**CLAU'DIUS I.**, TIBERIUS, a Roman emperor, the youngest son of Nero Claudius Drusus, step-son of the Emperor Augustus, was born at Lyon 10 B. C. He was naturally sickly and infirm, and his education was neglected, or left to be cared for by women and freedmen. His supposed imbecility saved him from the cruelty of Caligula; but C., in his privacy, had made considerable progress in the study of history, and wrote in Latin and Greek several extensive works now lost. After the assassination of Caligula, C. was found by the soldiers in a corner of the palace, where, in dread, he had concealed himself. The prætorians carried him forth, proclaimed him emperor, and compelled his recognition by the senate and many citizens who had hoped to restore the republic. By his payment of the troops, who had raised him to the throne, C. gave the first example of the baneful practice which subjected Rome to a military despotism under the succeeding emperors. The first acts of his reign seemed to give promise of mild and just government, but in the year 42, when a conspiracy against his life was detected, his timidity led him to yield himself entirely to the guidance of his infamous wife, Messalina, who, in concert with the freedmen Pallas and Narcissus, practised cruelties and extortions without restraint. C. meanwhile lived in retirement, partly occupied in studies, and expended enormous sums in building, especially in the famous Aqua Claudia (Claudian Aqueduct). This great work occupied 30,000 labourers during eleven years. Abroad, the armies of C. were victorious. Mauritania was made a Roman province, the conquest of Britain was commenced, and some progress was made in Germany. After the execution of Messalina, another woman equally vicious and more cruel, Agrippina (q. v.), married the emperor, and destroyed him by poison 54 A. D., in order to secure the succession of her son Nero. After his death, C. was deified.


Coin of Claudius, representing his British triumph.
From the British Museum.

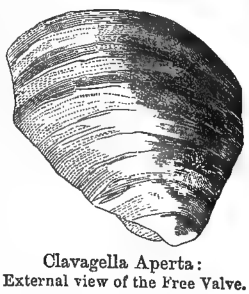
**CLAUSE.** See DEED.

**CLAUSEL**, BERTRAND, a French marshal, was born at Mirepoix, in the department of Ariège, December 1772, and entered the army at an early age. He commanded a brigade in the Italian campaign of 1799; was made a general of division of the Army of the North in 1802; and distinguished himself in the campaign of 1809 against Austria. The chief field of his fame, however, was Spain, where, after the battle of Salamanca, July 22, 1812, he succeeded Marmont in the command. He conducted the very difficult retreat from Portugal with the greatest circumspection, having to sustain a succession of battles. Although he had fought for Napoleon to the last, Louis XVIII., on his first restoration, named him inspector-general of infantry. When Napoleon again landed in France in 1815, C. immediately declared for him, was made a peer, and received the command of the Army of the Pyrenees. On the return of the Bourbons he was declared a traitor, but escaped to America; was condemned to death in his absence, but was subsequently permitted to return to France; and in 1830, after the July revolution, he received the command of the troops in Algeria, and made a successful expedition over the Atlas range into the province of Titeri, for which he was made marshal of France. Some misunderstanding, however, soon led to his recall; but he was again appointed governor-general of Algeria in 1835. After the disasters that befell the French arms before Constantine in 1836, and which were attributed in great part to him, he returned to France and defended himself—though not quite successfully—both from the press and the tribune, against the attacks made upon him. C. died at Secourrieu (Haute Garonne), 21st April 1842.

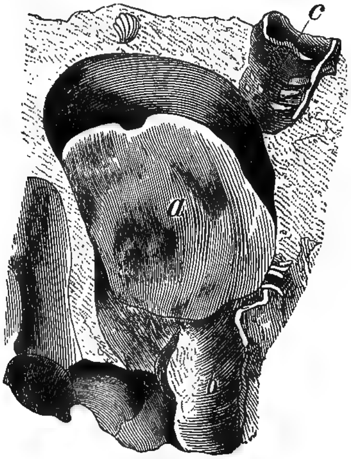
**CLAU'SENBURG.** See KLAUSENBURG.

**CLAU'STHAL.** See KLAUSTHAL.

**CLAVAGE'LLA**, or **CLU'B-SHELL**, a genus of Lamellibranchiate Mollusks of the same family with Aspergillum (q. v.), of which fossil species were first known to naturalists, but existing species have also been discovered. These mollusks inhabit holes, which they excavate for themselves in rocks or in masses of coral, and the ordinary form of the bivalve shell is curiously modified; one valve being fixed to the inner surface of the chamber in which the animal lives,


Clavagella Aperta:
External view of the Free Valve.

and the other free and capable of motion on its hinge within that chamber, whilst the shelly substance of the fixed valve is continued without interruption into a tube extending from the chamber outwards. The young mollusk is supposed to make its way into the rock by excavating this tube, but whether its excavations are accomplished by mere mechanical means, or by the aid of some chemical solvent, is still uncertain.—Fossil *Clavagellæ* have not been found in any strata older than the supracretaceous group.



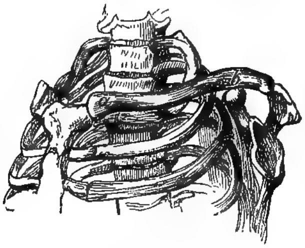
Clavagella Lata :
Shewing the Cavity and Fixed Valve.

*a*, the fixed valve; *b*, the calcareous tube; *c*, a cavity communicating by a tubule with that of the clavagella.

**CLA'VICLE**, or **CO'LLAR-BONE**, a bone which, in conjunction with the Scapula (q. v.) or Blade-bone, forms the shoulder. It derives its name from the Latin word *clavis*, in consequence of its resemblance to the key used by the Romans. As reference to the figure shews, it is placed horizontally at the upper and lateral part of the thorax, immediately above the first rib, and it articulates internally with the upper border of the Sternum (q. v.) or Breastbone, and externally with the acromion process (or highest point) of the scapula.

Its chief office is to keep the shoulders well separated and steady, and to afford a fulcrum by which the muscles (the deltoid and great pectoral) are enabled to give lateral movement to the arm. Accordingly, it is absent in those animals in which the movement of the fore-limbs is only backwards and forwards (in one plane) for the purpose of progression, as in the Pachydermata, Ruminantia, and Solidungula; while it is present in all Quadrumana and in those of the Rodentia in which the anterior extremities are used for prehension as well as motion, as the rat, squirrel, and rabbit; and in the Cheiroptera and Insectivora, as the bat, mole, and hedgehog. In the mole it occurs in the form of a cube, being very short and broad, and of extreme strength. In many of the Carnivora (the cat, for example), the C. is present in the rudimentary form of a small bone suspended (like the hyoid bone in the neck) amongst muscles, and not connected either with the sternum or with the scapula. In Birds, where great resistance is required to counteract the tendency of the enormous pectoral muscles to approximate the shoulders, the clavicles are large and united at an angle in the median line (just above the anterior end of the sternum) into a single bone, anatomically known as the 'furculum,' but popularly recognised as 'the merry-thought.' (A lateral view of the furculum is given in the figure of the skeleton of the Golden Eagle in the article BIRDS.) In this class of animals, additional, and even more efficient, support to the anterior extremity is afforded by the extension of the coracoid process of the scapula into a broad thick bone called the 'coracoid bone' (q. v.), which extends to the sternum. It is unnecessary to trace the various modifications which this bone presents in Reptiles and certain Fishes.

In the human subject, the C. being exposed to the full force of blows or falls upon the shoulder, and not being easily dislocated (in consequence of its being well secured at both ends), is very frequently broken.



*ab*, the Clavicle.

Ossification takes place in the C. earlier than in any other bone, commencing as early as the 30th day after conception, according to Beclard; and at birth it is ossified in nearly its whole extent. Mr Humphrey (in his admirable *Treatise on the Human Skeleton*) suggests that the early ossification of this bone is a provision on the part of nature to prevent it from being fractured at birth in case of difficult labour.

Much important anatomical and physiological matter in connection with this bone will be found in Humphrey's work above cited, and in a memoir which he has recently published in the Transactions of the Cambridge Philosophical Society; in Owen, *On the Nature of Limbs;* and in Struthers, *Osteological Memoirs, No.* 1, *The Clavicle.*

**CLAVICO'RNÉS** (Lat. club-horned), a great family of coleopterous insects, of the section *Pentamera*, distinguished by the club-shaped termination of the antennæ, which are longer than the maxillary palpi. Most of the beetles of this family feed on animal substances, and many of them, and particularly their larvæ, find their appropriate food in substances undergoing decay. It contains many genera, divided into groups (tribes), *Histeroides, Silphales, Dermestini*, &c. Burying Beetles and the Bacon Beetle may be mentioned as examples of it.

**CLAVI'GERO**, FRANCESCO SAVERIO, a Mexican historian, was born in Vera Cruz, South America, about 1720, and entering the order of the Jesuits, was educated as an ecclesiastic. Sent as a missionary among the Indians in various parts of Mexico, he lived among them for 36 years, and made himself fully acquainted with the languages, traditions, and antiquities of the aboriginal tribes. On the suppression of the Jesuits in South America by Spain, in 1767, C. sailed for Italy, and with others of his brethren had the town of Cesena assigned to them by the pope as a place of residence, where he died October 1793. He wrote in Italian a *History of Mexico*, a comprehensive and valuable work, of which an English translation by C. Cullen was published in 1787, in 2 vols. 4to.

**CLAY** (Ang.-Sax. *clæg;* of the same root as *clag, claggy*), a term applied, in a vague way, to those kinds of earth or soil which, when moist, have a notable degree of tenacity and plasticity. The clays are not easily distinguishable as mineral species, but they all appear to owe their origin to the decomposition of other minerals, and to consist chiefly of alumina in combination with silica and with a certain amount of water. See ALUMINA, SHALE, LOAM, PIPE-CLAY, KAOLIN, &c. Common C., when, from the large proportion of alumina which it contains, it is sufficiently plastic, is of great use for making bricks (q. v.), tiles, &c.

C. is used by sculptors and others engaged in the production of works of plastic art, as a means of adjusting the form which is to be given to their work, in the harder or more enduring substance of which it is ultimately to be composed. As modelling C. is apt to crack in drying, it must be kept damp by sprinkling water over it, and covering it with a wet cloth when the artist is not engaged in his work.

CLAY SOILS derive their character from the alumina which they contain in a state of mixture, as well as in chemical combination with other substances. Some soils contain as large a proportion of alumina as 40 per cent., but generally the proportion is much smaller. The felspar which chiefly yields the alumina of clay soils contains also soda and potash, substances essential to vegetables, and which tend to render clays fertile when under cultivation. The physical characters, however, of the different varieties of clay soils arising from the varying proportions of silica, and other substances mixed with the alumina, are chiefly concerned in their relative fertility. Calcareous matter exercises a considerable influence on their powers of producing crops.

In Scotland, clay soils are chiefly found on the coal-measures, the boulder-clay, and as alluvium in the valleys. Those derived from the coal-measures are generally unkindly, being tenacious and difficult to labour. In the eastern counties, these are usually farmed on a five or six course shift, according to their quality. In the western, the moister climate is less suited for cultivating them to advantage, and dairy husbandry usually prevails where they are found under culture. The clay soils derived from the boulder-clays are also generally coarse and inferior in quality. The richest clay soils are found along the margins of the rivers, and go under the name of *carse* clays, which have already been described under that head. In the north of England, the aluminous shales of the coal-measures yield soils very similar in their properties to those in Scotland. England also abounds in clay soils derived from other geological formations. The chief of these are the London, plastic, weald, Gault, and blue lias clays. The stubborn character of many of them is such that they are not suitable for tillage, but form excellent meadows and pastures. In the dry climate of Suffolk, strong clays are cultivated with great success on the four-course shift—1. Seeds, 2. Wheat, 3. Fallow or Roots, 4. Barley. Thorough drainage has greatly increased the value of clay soils under cultivation. Being so much sooner dry in spring, a longer period is obtained for preparing the land for putting in the crops. Weeds, too, are much more easily extirpated, and the strength of the soil is more entirely directed towards the raising of the crops. Wheat, beans, and clover are the crops which clay soils carry in greatest perfection. Clay soils have been long known to be retentive of moisture as well as of manure. Recent chemical investigations have shewn, that clay soils have remarkable powers for absorbing ammonia, potash, and other substances, which constitute the food of plants. This property, it is now pretty well ascertained, arises from surface attraction.

**CLAY**, CASSIUS M., perhaps the most distinguished and eloquent of the opponents of American slavery, was born in Madison county, Kentucky, in 1810. He has long taken a very active part, both from the platform and through the press, in promoting abolition views; and, indeed, he may be almost regarded as America's representative-man on this question. His speeches, &c., edited by Horace Greeley, were published in New York in 1848.

**CLAY**, HENRY, an American statesman of some distinction, was born April 12, 1777, in Hanover county, Virginia. He early devoted himself to the law, and fixing his residence at Lexington, Kentucky, soon obtained a lucrative practice and political influence enough to be elected to the state legislature. In 1806 he was elected to Congress, and again in 1809 he was chosen senator for a term of two years. In 1811 he was sent to the House of Representatives, where he was immediately elected Speaker. A strong advocate of nationality, he denounced the claims put forth by England as to right of search; he was a strenuous supporter of the war with that country, and in consequence was sent, in 1814, as one of the commissioners to sign the treaty of peace at Ghent, where his acuteness secured for America some advantages. On his return, he exerted all his talents in favour of the independence of South America, and laboured hard to eradicate all European influence from the American continent. C., however, is best known as the author of the famous 'Missouri Compromise,' restricting slavery to the states south of 36° 30′ N. lat.; and also for the compromise of 1850, known as C.'s 'Omnibus' measure. He died June 1852. C. had undoubted talents, but he was by no means a comprehensive statesman. He was by far too fertile in compromises to be the author of any measure conferring lasting benefit on his country. He was very popular during his lifetime, and was two or three times proposed for the presidency, an honour, however, which he never succeeded in obtaining.

**CLAY'MORE** (meaning 'the great sword'), the Gaelic name for a kind of sword at one time much used, but not so well known at present. It had a double-edged blade, about 43 inches long by 2 inches broad; its handle was often 12 inches long, and its weight 6 or 7 lbs.

**CLAZO'MENÆ**, one of the twelve cities of Ionia. It was originally built on the Hermæan Gulf, westward from Smyrna; but the inhabitants having, through fear of the Persians, fled to a neighbouring islet, and Alexander the Great having connected the islet with the mainland by a dike, the city subsequently extended over the peninsula thus formed. It is now called Vurla.

**CLEÄ'NTHES**, a Stoic philosopher, born at Assos, in Troas, about 300 B.C. His poverty was such, that he had to work all night at drawing water, in order to obtain money for his support, and to pay his class-fee while attending the lectures of Zeno. For nineteen years he listened patiently to the great Stoic, and, on his death, succeeded him in his school. He died of voluntary starvation when about 80 years old. C. differed, it is said, from the other Stoics, in regarding the sun as the governing principle of the world; but none of his writings are extant except a *Hymn to Zeus*, one of the purest and noblest pieces of poetry in the Greek language. It is an admirable union of religious feeling and philosophic thought, and impresses us very strongly in favour of the author, who, from all we can learn, was a man of stern and serious character. The *Hymn to Zeus* was published in Greek and German by Cludius (Göttingen, 1786), and re-edited by Merzdorf (Leip. 1835).

**CLEAR**, Cape, a headland of Clear Island, the most southerly extremity of Ireland, and locally belonging to Cork county. Cape C. is elevated more than 400 feet above the sea, and has a light-house, lat. 51° 26′ N., long. 9° 29′ W., with a bright revolving light 455 feet above the water-level.

**CLEARANCE**, in the mercantile marine, is a permission from the custom-house officers, or the emigration officers, or both, for the departure of a ship from a port, denoting that all the formalities have been observed, and all dues, &c., paid. If a foreign vessel, she must also be certified by the consul of the nation to which she belongs. Hence the expression *cleared out*, in reference to the departure of a particular ship.

**CLEA′RING-HOUSE**, in Banking. The business facilities afforded by bankers to their customers in collecting their bills, cheques on other firms, and like obligations, early imposed the necessity for an organised form of interchange of such securities, which would at once save labour and curtail the amount of floating cash requisite to meet the settlements of the bankers if effected singly. This was first done by the clerks, when out collecting from the different banking-houses, meeting daily at the counter of one of the houses for the purpose; but about 1775, the building in Lombard Street, known as the 'Clearing-house,' was set apart for it, under the direction of a committee delegated by the different firms, and the immediate management of two paid inspectors. The arrangement of the establishment may be briefly described: From time to time during the day each firm transmits to the C. cheques and bills which are payable by other bankers for classification, taking account of the obligations coming against their firm, so that, at the close of the day, they are the better able to make up their private books. At 4 o'clock the accounts are closed; each bank has till 4.45 to decide whether it will honour the drafts upon it; and by half-past 5, the officials are able to learn that the several houses are agreed between themselves, who has to pay money and who has to receive, and how much, by making up an account of the form subjoined. It is made up as between the particular bank receiving it and the C. representing every other bank with whom the former may have had any business on the day in question:

GLYN.

| Debtors. | Balance. | | Balance. | Creditors. |
|---|---|---|---|---|
| 280,000 | 20,000 | Barclay | | 260,000 |
| 50,000 | 10,000 | Bosanquet | | 40,000 |
| 110,000 | | Commercial | 10,000 | 120,000 |
| 115,000 | 5,000 | Currie | | 110,000 |
| 50,000 | 5,000 | Fuller | | 45,000 |
| 100,000 | 10,000 | Hanbury | | 90,000 |
| 110,000 | | Hankey | 5,000 | 115,000 |
| 280,000 | | Jones | 20,000 | 300,000 |
| 150,000 | | Lubbock | 10,000 | 160,000 |
| 200,000 | | Masterman | 15,000 | 215,000 |
| 50,000 | | Olding | 5,000 | 55,000 |
| 65,000 | 5,000 | Spooner | | 60,000 |
| 165,000 | 5,000 | Union | | 160,000 |
| | 60,000 | | 65,000 | |

The comparatively small balance thus exhibited, used to be settled by each banking-house which owed money sending down to the C. the amount, and paying it, not to the officials there, but to any clerk whose house claimed a balance. But now, to avoid the risk of handling such a large amount of bank-notes, it is settled by means of a species of cheque on the Bank of England appropriated to the purpose, called *transfer tickets*, signed by each banking-house, and certified by an inspector of the clearing-house. A white one is used when the bank has to pay a balance to the C., and a green one when it has to receive a balance from it. By this means, transactions to the amount of several millions daily are settled without the intervention of a bank-note; and the importance of the arrangement may be assumed from the fact, stated in evidence before the House of Commons, that before the connection of the London and Westminster Bank with the C., they were obliged to keep in hand £150,000 in notes for negotiating their exchanges.

**CLEARING-HOUSE**, The Railway, is an association instituted to enable railway-companies in England and Scotland, to carry on, without interruption, the through traffic in passengers, animals, minerals, and goods passing over different lines of railways, and to afford to the traffic the same facilities as if the different lines had belonged to one company. The arrangements are called 'the clearing system,' and are conducted by a committee appointed by the directors of the companies who are parties to it. The business is carried on in a building in Seymour Street, London, adjoining the Euston Station. The association is regulated by act of parliament, 13 and 14 Vict. 33 (25th June 1850), called 'The Railway Clearing Act, 1850.' Any railway-company may apply for admission to the system, and, on being accepted, becomes a party to it. The companies are each represented on the committee by a delegate. Ten delegates form a quorum. The committee holds stated meetings on the second Wednesday in March, June, September, and December in every year, and at such other times as may be found necessary. The accounts of the clearing-system, and the balances due to and from the several companies, are settled and adjusted by the secretary of the committee, with appeal to the committee, whose decision is final. The expenses are defrayed rateably by the companies. The clerks at stations of the various companies send abstracts of all traffic monthly. The collected passenger-tickets, and several other details, are forwarded weekly. Number-men are employed by the C., who attend at each railway-junction, and watch the arrival and departure of every train passing the junction. They note the number of every carriage, horse-box, wagon, van, and sheet or wagon-cover on the train, and also all damaged stock, and make weekly returns. The destination of each wagon is also noted. The returns from the companies' stations, together with those of the number-men, enable the accounts to be made up at the C., and, after examination, the companies are debited and credited, as the case may be. A debtor and creditor account is sent from the C. monthly to each company, shewing, on the one side, what the company has to receive from others as their proportion of through passenger-fares, through goods rates and mileage of carriages, wagons, and sheets, and, on the other side, what the company has to pay to others out of monies drawn by them. The balance is struck, and, if against the company, a remittance must be made. If the balance is on passenger-traffic, it is due five days after the date of the C. advice. The other balances must be paid within twenty-three days. Interest at the rate of 7 per cent. per annum is charged on outstanding balances. The cost of maintaining the C., with its officers and numerous clerks and number-men, is apportioned amongst the respective companies—(1.) In proportion to the number of entries at the credit of each in the mileage account; (2.) In the ratio of the number of vehicles and sheets recorded by the number-men; and (3.) According to the time occupied on the accounts.

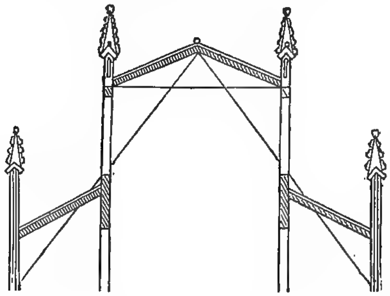
Regulations are published annually by the C. in January, for the guidance of the different companies in connection with the system. These determine the principles of classification of goods, division of rates, terminal allowances, payment for loss or damage of goods, and other points. A committee of general managers is appointed, whose duty it is to arbitrate on claims for damages to rolling-stock. A committee of goods' managers adjudicate cases of disputed liability which relate to goods' traffic. A committee of coaching superintendents perform a similar duty with reference to coaching or passenger traffic. The mileage of carriages is also regulated, being three-farthings per mile first class, and a halfpenny for second. A varying rate for wagons and sheets is allowed according to distance, the highest charge for distances under 150 miles being one half-penny for box-wagons, $\frac{3}{8}$ of a penny for open wagons, and $\frac{1}{8}$ of a penny for sheets. If carriages are detained beyond one clear day, demurrage is charged at the rate of 10*s.* per day for first-class carriages, and 6*s.* for second-class. If wagons are detained beyond two clear days, 3*s.* a day is charged. Sheets, after two days, are charged 6*d.* for the first day, and 1*s.* per day after. The terminal allowances are 8*s.* 6*d.* per ton in London, and 4*s.* in the country for carted goods; 1*s.* 6*d.* per ton when not carted.

In 1861, the number of companies parties to the clearing-system was 117, and the amount of business of an intricate kind which was involved may be judged of from the foregoing particulars. In short, the C. system of Great Britain is a vast organisation, adapted, in an extraordinary degree, to save trouble in accounting, as well as to prevent petty disputes, among the individual companies concerned. The very circumstance of all the used passenger-tickets in the kingdom being transmitted to a common centre for adjustment as to the claims of one company against another, affords in itself a remarkable instance of an ingenious system for elaborating simplicity out of what would almost appear a commercial chaos.—There is a similar railway C. system in Ireland, with its head-quarters in Dublin.

**CLEARING-NUT** (*Strychnos potatorum*), a small tree of the same genus with the NUX VOMICA (q. v.), abundant in the forests of India, and of which the seeds are much used for clearing water. They are sold for this use in the bazaars, and travellers commonly carry some with them. These seeds being rubbed on the inside of a vessel, muddy water put into it very quickly becomes clear, all impurities settling to the bottom. The tree has a deeply fissured bark; ovate, smooth, and pointed leaves; and a shining, black, pulpy fruit, with only one seed. The wood is very hard, and is used for various purposes.

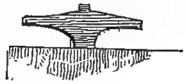
**CLEARNESS**, a quality of art which is realised by a skilful arrangement of colours, tints, and tones. Where C. is to be obtained without sacrificing depth, a knowledge of *chiaroscuro* (q. v.) becomes indispensable.

**CLEA'R-STORY**, or **CLERE-STORY**. Originally this term was applied generally to the upper part of any building, which was lighted by several windows, or by a row of small windows or openings in the wall. Latterly, it came to be applied exclusively to the upper part of the central aisle of a church, in which windows were found above the roof of the side aisles. The object of the C. in churches appears to have been to increase the light in the nave, but the windows in our existing churches are generally so small as to effect this object very imperfectly. In many churches, the C. is a subsequent addition, and has often been added when the high-pitched roof, which included the side aisles in its span, gave place to a flat one covering the nave only. The walls over the arches of the nave were then raised so as to receive the C. windows.



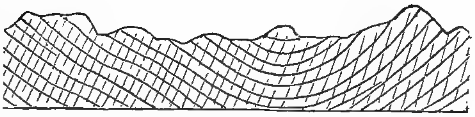
Clear-story of Church.

**CLEATS**, in Ship-building, are pieces of wood fastened to various parts of the vessel, and having holes or recesses for fastening ropes. There are several kinds, applied to various purposes, and bearing the names of *belaying*, *comb*, *mast*, *shroud*, *single*, *stop*, *thumb*, &c., cleats.



Cleat.

**CLEAVAGE**, or **SLATY CLEAVAGE**, is a condition of rocks in which they split easily into thin plates. The direction of these laminæ may be in the plane of stratification, but it much more frequently differs from it. C. is the result of an operation which is subsequent to, and entirely independent of, the original stratification of the rocks. It is impossible to determine what is the producing cause of this phenomenon. By some it has been considered to be due to crystalline agency, while others maintain that it arises from the pressure of mechanical forces at right angles to the planes of C., and yet others seek an explanation in a combination of these two agencies. Professor Sedgwick, who has carefully examined the phenomena of C., has arrived at the following general results:

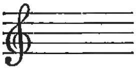
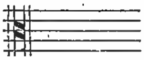
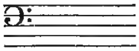


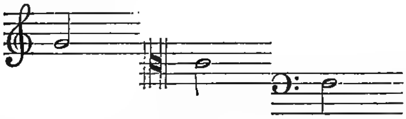
Section exhibiting Lines of Cleavage.

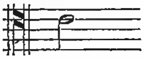
1. That the strike of the C. planes, when they were well developed, and passed through well-defined mountain-ridges, was nearly coincident with the strike of the beds; 2. That the dip of these planes (whether in quantity or direction) was not regulated by the dip of the beds, inasmuch as the C. planes would often remain unchanged while they passed through beds that changed their prevailing dip, or were contorted; 3. That where the features of the country or the strike of the beds was ill defined, the state of the C. became also ill defined, so as sometimes to be inclined to the strike of the beds at a considerable angle; 4. Lastly, that in all cases where the C. planes were well developed among the finer slate-rocks, they had produced a new arrangement of the minutest particles of the beds through which they pass.

C., though generally confined to clay-slate, yet occasionally occurs in lime and sandstone; but in proportion as the rocks are coarse, the C. planes become fainter and wider apart. In the fine-grained clay-slate, on the other hand, the laminæ are thin, smooth, and parallel; and as C. is always accompanied with more or less induration in the rock where it exists, clay-slate, thus altered, is of great economic value for roofing.

**CLEAVERS**, or **GOOSE-GRASS** (*Galium Aparine*), a species of Bedstraw (q. v.), a coarse annual, with whorls of 6—8 leaves, both stem and leaves rough with reflexed bristles, the fruit also hispid, and when ripe, very ready to adhere to any passenger who may brush against it; a very common weed in hedges and bushy places in Britain and most parts of Europe; but which has, from time to time, been brought into notice as possessing a remarkable specific power over some of the most formidable cutaneous diseases, including even lichen and leprosy, also over cancer. It is administered in the form of decoction or of extract. The whole subject of the properties of this herb seems to demand fuller examination.

**CLEF**, a musical character placed on the staff, by which the names of the notes are fixed. There are three kinds of clefs—viz., the G, the C, and the F clef. The G clef is placed on the second line, thus: ; the C clef on the third line, thus: ; and the F clef on the fourth line, thus: . The C clef is a fifth below the G clef, and a fifth above the F clef, thus:



The C clef is also placed on the fourth line for some instruments, and for the tenor part in vocal music, thus: ; and in old vocal music, the C clef placed on the first line was used for the soprano.

**CLEG**, a name given to some insects of the dipterous family *Tabanidæ*, the females of which are extremely troublesome to horses, cattle, and human beings in summer, piercing their skins by means of a curious apparatus of small lancets with which the mouth is furnished, and drinking their blood. The name C. is sometimes given in England to *Chrysops cæcutiens*, a fly frequent in most parts of Europe, but rare in Scotland, and which not unfrequently inserts its proboscis through the sleeve, or some other part of the dress, and thus makes man himself the object of its attack. It is about one-third of an inch in length, mostly black, with yellow markings on the abdomen, and very large eyes of the most beautiful green and golden colours. The insect always called C. in Scotland, is *Hæmatopòta pluvialis*—a rather smaller fly, mostly of a gray colour, but also remarkable for its very large and beautiful eyes, which are greenish, with waved purplish-brown bands. In England, it is sometimes called the *Stout*.

Cleg (*Chrysops cæcutiens*).

**CLE'MATIS** (Gr. *clēma*, the shoot of a vine), a genus of plants of the natural order *Ranunculaceæ*, having four coloured sepals, no corolla, and for fruit numerous one-seeded achænia with long—generally feathery—awns. The species are pretty numerous, herbs or shrubs, generally with climbing stems, natives of very different climates, and much scattered over the world. They possess more or less active caustic properties. The long awns give the plants a beautiful appearance even in winter. The flowers of many species are also beautiful. *C. Vitalba*, the common TRAVELLER'S JOY (fancifully so named because of its ornamental appearance by the wayside), is the only native of Britain. It is common in the south, but becomes rarer towards the north, and is scarcely found in Scotland. The twigs are capable of being made into baskets. It rapidly covers walls or unsightly objects. The fruit and leaves are acrid and vesicant, the leaves are used as a rubefacient in rheumatism; and those of other species are also employed in the same way.—A number of species are commonly cultivated in our gardens. *C. flammula*, a native of the south of Europe and north of Africa, with white flowers, which have a very strong honey-like smell, is the species known as Sweet Virgin's Bower.

Clematis Vitalba.

**CLE'MENS**, TITUS FLAVIUS, a celebrated father of the Christian Church, was born probably at Athens, and resided during the greater part of his life in Alexandria, whence the epithet *Alexandrinus*. He flourished at the close of the 2d and the beginning of the 3d century. In his earlier years, he devoted himself with great zeal to the study of philosophy. His love of knowledge induced him to visit Greece, Italy, Syria, Palestine, and other countries. It is not known at what precise period he was converted from heathenism; but it is certain that after coming to Egypt, and listening to the prelections of Pantænus, he joined the Alexandrine Church, and was made a presbyter. Afterwards he became assistant to his master, who held the office of *catechist.* In 202 A.D., the persecution of the Christians under Severus compelled him to flee to Palestine. He is supposed to have returned to Alexandria about 206, and in 211 succeeded Pantænus. The year of his death is differently stated; some writers think it probable he died 213 A. D.; others, as late as 220. His most distinguished pupil was Origen.

C. was a very fertile writer. The chief productions of his which have survived are the *Protrepticus*, *Pædagogus*, and *Stromata*—which together form one large work. The first is an exhortation to the heathen to abandon idolatry; the second, an exposition of Christian ethics; and the third, a collection of treatises and brief observations on Greek and Christian literature. They shew that C., when he became a Christian, did not cease to be a philosopher; instead of railing at science, he felt himself bound to make use of it, wherever it was helpful, in the elucidation of the higher questions of religion. Among the Fathers, *Biblical criticism*, in the strict sense of the term, was unknown, and speculative philosophy was the only critical instrument in their possession. It is not to be wondered at, therefore, if much that is fantastic and absurd is to be found in their writings. C. certainly displays no lack of uncritical errors; but it is equally certain that the introduction of philosophy into Christianity helped to preserve the church from lapsing into the narrowness and ceremonialism of Jewish worship. The impression which we gather from C.'s writings, is that he was a man of broad, earnest sympathies, sincere piety, and liberal views in regard to the purposes of God's providence. This catholicity of mind procured him the accusation of heresy, and lost him the title of saint. C. was also a writer of Christian hymns, one of which, addressed to the Redeemer, is preserved. His collective works were first published at Florence in 1550.

**CLEMENS**, or **CLEMENT**, is the name of 17 popes, few of whom require any special notice. See POPES. CLEMENS ROMANUS, probably the C. mentioned in the Epistle to the Philippians, is assumed as the first of the series. He is accounted one of the apostolic fathers. He is said to have died as bishop of the church in Rome, in the year 102. Of his two *Epistles to the Corinthians*, the first and longest is undoubtedly genuine. But the Apostolical Canons and Constitutions attributed to him are spurious, as well as the fabulous account of his journeys with the apostle Peter. This last has come down to us in two forms: one in Greek, divided into 19 Homilies, under the title of *Clementina;* the other, a Latin translation by Rufinus, entitled *Recognitiones Clementis.* The Epistles have been edited by Muralt (Zurich, 1848), the Homilies by Schwegler (Stutt. 1847), and the Recognitiones by Gersdorf, in his *Biblioth. Patr. Eccl.*, vol. i. (Leip. 1837).

**CLEMENT XIV.**, GIOVANNI VINCENZO ANTONIO GANGANELLI, was born in 1705 at St Arcangelo, near Rimini, where his father was a physician. At the age of 18, he entered the order of Minorites, and studied philosophy and theology, which he then successfully taught. His merits were appreciated by the keen-sighted Benedict XIV., who appointed him to the important post of counsellor to the Inquisition, and under Clement XIII. he was made a cardinal. On the death of Clement XIII., he succeeded to the papal chair, May 19, 1769. No pope had ever been elected under greater difficulties. The kings of Portugal, France, Spain, and Naples were at variance with C., chiefly on account of his support of the Jesuits; Venice wished to reform the religious orders without his interference; Poland was seeking to diminish his influence; the Romans themselves were discontented. C. first set about reconciling the monarchs; he sent a nuncio to Lisbon, suspended the bull *In Cœna Domini*, and entered into negotiations with Spain and France. After several years of negotiation, he issued, 1773, the famous brief *Dominus ac Redemptor noster*, suppressing 'for ever' the society of the Jesuits. The motive assigned in the brief is, 'regard to the peace of the church.' From this time his life was made miserable by constant fear, and his strength gradually gave way. He died of a scorbutic disease, September 22, 1774. C. was remarkable for liberality of mind, address as a statesman, sound learning, and mildness of character. He cherished the arts and sciences, and was the founder of the Clementine Museum, which, by the additions of Pius VI. and Pius VII., became the chief ornament of the Vatican.

**CLEME'NTI**, MUZIO, one of the best of pianists and composers for the pianoforte, was born at Rome in 1750 or 1752. His skill on the pianoforte, when only 13 years of age, secured for him the notice of a Mr Beckford, an English gentleman travelling in Italy, with whom C. went to England, and in whose family he remained for several years, studying the works of the great composers, and where he also acquired an extensive knowledge of literature. His 'Opera 2' (composed in his 18th year) is considered the model on which the whole modern pianoforte sonatas have been founded. After travelling on the continent for some time, he returned to England, where he obtained the highest reputation as a teacher. Pecuniary misfortunes induced him, in the year 1800, to commence business as a music-seller and manufacturer of pianofortes. He died in London, March 10, 1832. His compositions, mostly pianoforte sonatas, are full of pleasant melody, and arranged in masterly style. For students, his classical *Introduction to Pianoforte Playing*, and his last work, the *Gradus ad Parnassum*, have been highly recommended. His style of playing was brilliant, and in improvisation he excelled all his predecessors.

**CLEOME'DES**, a Greek writer on astronomy. Nothing is known regarding his life, nor the period when he flourished. His treatise is entitled *The Circular Theory of the Heavenly Bodies*, and is remarkable as containing, amid much error and ignorance, several truths of modern science—such as the spherical shape of the earth, the revolution of the moon about its axis, its revolution round the earth, &c. C.'s treatise was first printed in Latin by Geo. Valla (Ven. 1498); in Greek, by Conrad Neobarius (Par. 1529). The two latest editions are those of Janus Bake (Lugd. Bat. 1820) and C. C. T. Schmidt (Leip. 1832).

**CLE'ON**, a famous Athenian demagogue, who flourished during a part of the Peloponnesian war, was originally a tanner, but having a strong bias towards politics, he gradually abandoned his business, and became the champion of popular 'rights.' He first became prominent in the discussion regarding the fate of the Mytilenæan prisoners, 427 B. C. C. advocated the massacre of the males, carried his point, and more than 2000 perished; the rest were saved through the remorse of the Athenians. In 425 B. C., along with Demosthenes, he commanded an expedition against the island of Sphacteria, which was garrisoned by the Lacedemonians, and, much to the surprise of every one, succeeded in reducing the place; but the whole merit of this deed is usually attributed to his colleague. C. himself, however, was highly elated with his success, and his countrymen, or, at least, many of them, appear to have fancied that he really possessed military genius, for in 422 B. C. he was sent to oppose Brasidas, the Spartan general, in Macedonia and Thrace. On his way thither, he took Torone, a town in which Brasidas had left a small garrison, and afterwards Galepsus. But the great design of the campaign was the capture of Amphipolis, where Brasidas was stationed. C. somewhat reluctantly advanced, and began to reconnoitre. While he was so doing, Brasidas made an unexpected sally, and in the battle which ensued both leaders were slain. The Athenian army, however, was defeated, and obliged to retreat. The general opinion of C. is not favourable. He is painted both by Thucydides and Aristophanes as an ignorant, vain, blustering, and cowardly *mobocrat*. Most modern historians have accepted this estimate of the man; but Grote, in his *History of Greece*, has thrown very considerable doubt on its truth, and has laboured to shew that he was the rough but resolute champion of the people, and that his character has been vilified and abused by Aristophanes, who was—there can be no doubt—violently aristocratic.

**CLEOPA'TRA**, the daughter of the Egyptian king, Ptolemy Auletes, was born 69 B. C., and, according to the will of her father, should have inherited the throne along with her brother, Ptolemy Dionysus, who was also her husband. Her claim, however, being opposed, Julius Cæsar came to Alexandria, 48 B. C., to interpose in the quarrel, and in the Alexandrian War, Ptolemy Dionysus fell, and C., who was now married to her younger brother, Ptolemy, a boy of eleven years, was established upon the throne of Egypt. She bore a son to Cæsar, who was named Cæsarion. On her visiting Rome, Cæsar received her with great magnificence, and placed her statue in the temple which he had built to Venus Genitrix. In the civil war, after Cæsar's assassination, C. at first hesitated which side to take. After the battle of Philippi, Antony summoned her to appear before him at Tarsus, in Cilicia, to give account of her conduct. C., who had in the meantime got quit of the youthful Ptolemy by poison, appeared in the character of Venus Anadyomene, and so fascinated Antony, that he ever afterwards remained devoted to her. They spent the winter, 41—40 B. C., in Alexandria, in revelry; and Antony, although he had in the meantime married Octavia, the sister of Octavianus, returned to the embraces of C., who met him at Laodicea, in Syria, 36 B. C., and accompanied him to the Euphrates. His general residence from this time was with her at Alexandria. He bestowed upon her and upon her children great estates, which, however, he had no right so to dispose of. Upon this and other accounts, he became the object of great detestation at Rome, and war was declared against C., Antony being now regarded as her general. At her instigation, he risked the great naval battle of Actium (q. v.); and when she fled with 60 ships, he forgot everything else, and hastened after her. When Octavianus appeared before Alexandria, C. entered into private negotiations with him for her own security, which treachery becoming known to Antony, he vowed revenge; but a report coming to him that she had committed suicide, he thought it impossible to survive her, and fell upon his sword. Mortally wounded, and learning that the report which he had heard was false, he caused himself to be carried into her presence, and died in her arms. Octavianus, by artifice, succeeded in making her his prisoner. Failing to make any impression upon him, and finding that he spared her life only that she might grace his triumph at Rome, she took poison, or, as is said, killed herself by causing an asp to bite her arm. Her death took place in August, 30 B. C. Her body was buried beside that of Antony, and Octavia brought up the children whom she had born to Antony as if they had been her own.

**CLEPSY'DRA**, an ancient Greek musical instrument, described by Athenæus as having pipes which were made to produce a soft sound by the agitation of water forcing air into them. There were levers for admitting the water, thus forming a kind of hydraulic organ.

**CLEPSYDRA** (Gr. *klepto*, I conceal, *hydor*, water), an instrument for measuring time by the efflux of water through a small orifice. Two kinds have been in use—one wherein the fluid is simply allowed to escape through the orifice; the other, in which the uniformity of the flow is secured by maintaining the fluid at a constant level in the instrument. The first would, like a sand-glass, give only an accurate measure of the time occupied in the escape of the whole fluid: of a shorter time, it would be an inaccurate measure, as the pressure under which the escape takes place at the commencement is greater than at any instant thereafter, and constantly diminishes with the height of the fluid column. In the second, the flow must be nearly uniform; and if the water be received into a uniform graduated tube as it escapes, we have a tolerably good clock. The rate of the flow, however, is affected by temperature and barometric pressure. The C. is supposed to have been used among the Chaldeans. The Romans employed it extensively. The invention of the pendulum has superseded it in modern times.

**CLERC, JEAN LE**, better known as JOHANNES CLERICUS, was born at Geneva, March 29, 1657, where his father was a clergyman. From an early period, he shewed a particular aptitude for the study of ancient languages, and in this department he is still a conspicuous name. He also paid great attention to theology, and his numerous controversial writings brought him no mean reputation during his lifetime. Before he was twenty, C. had imbibed heterodox opinions in religion. In 1678, he went as tutor to Grenoble, where he remained for two years; in 1680, he returned to Geneva, and was appointed to the clerical office. All the while, his objections to the accepted theology of the day had been growing: the works of Curcellæus and of Episcopius confirmed this antipathy, and now he appeared as Liberius de St Amore, the writer of eleven Letters against the Errors of the Scholastic Theologians—in short, as the partisan of the Dutch Remonstrants. In the latter part of 1681, C. left Saumur, whither he had gone to perfect his French, and went to Grenoble, and thence to London, where he preached six months to the Savoy congregation. Finally, he was appointed Professor of Philosophy, Classical Literature, and Hebrew at the Remonstrant seminary of Amsterdam. He died 8th January 1736. C.'s writings are very numerous; but his greatest service to posterity was the publication of a quarterly, the *Bibliothèque Universelle et Historique* (1686—1693, 25 vols., in 8vo), followed up by the *Bibliothèque Choisie* (1703—1713), and the *Bibliothèque Ancienne et Moderne* (1714—1727). Other works of C.'s are—*Harmonia Evangelica* (1700); *Traduction du Nouveau Testament avec des Notes* (1703); *Ars Critica* (3 vols., 1712—1730); and *Traité de l'Incrédulité* (1733). The first two are Socinian in their tendency. C.'s rationalism is still more manifest in a work entitled *Sentimens de quelques Théologiens de Hollande touchant l'Histoire Critique du Vieux Testament*, in which the special inspiration of the Scriptures is denied. His editions of several of the ancient classics prove both his learning and acumen.

**CLE'RGY** (Gr. *clēros*, a lot, an inheritance), a term very generally applied to the ministers of the Christian religion, in contradistinction to the *Laity* (q. v.). This use of the term is very ancient, and appears to have gradually become prevalent, as the ministers of religion more and more exclusively, instead of the members of the Christian Church equally, began to be regarded as God's 'heritage' and 'priesthood' (1 Pet. ii. 9, and v. 3), consecrated to him, and peculiarly his. The distinction between the C. and the laity became more marked through the multiplication of offices and titles among the C., the ascription to them of a place in the Christian Church similar to that of the priests and Levites in the Jewish Church, with peculiar rights and privileges, their assumption of a peculiar dress and of official insignia, the growth of monastic institutions, and the introduction of celibacy. In harmony with the notions on which this distinction is founded, is that of an indelible or almost indelible character derived from ordination, so that a renunciation of the clerical office is either viewed as an impossibility, or a sort of apostasy. These notions in their highest degree belong to the Church of Rome. In the Protestant churches, the distinction between C. and laity is much less wide; and although the same terms are often used, it is rather conventionally than in their full signification. The employment of official robes by the C. preceded their assumption of a peculiar ordinary dress, and is not so intimately connected with any peculiar pretensions. Among the privileges accorded to the C. by the Roman emperors, and in the middle ages, was exemption from civil offices; among the rights asserted by them, and which caused much dispute, was exemption from lay-jurisdiction, even in cases of felony. The C. were distinguished into the *higher C.* and the *lower C.*, the latter including janitors, acolytes, lectors, exorcists, &c. The term *Secular C.* is the designation of priests of the Church of Rome who are not of any religious order, but have the care of parishes. Monks who are in holy orders are designated *Regular Clergy.* See BENEFIT OF CLERGY.

**CLERK**, SHIP'S, is a civil officer on board a ship of war, under the immediate orders of the captain. He keeps all the captain's documents, which are very numerous; such as the ship's log, remarks on coasts and anchorages, the muster-book, &c.

**CLERK**, JOHN, of Eldin, Mid-Lothian, Scotland, inventor of the modern British system of breaking the enemy's line at sea, was the 6th son of Sir John Clerk of Penicuick, Bart. Though not a naval man, he studied deeply both the theory and practice of naval tactics, and in 1779 communicated to his friends a new manœuvre for 'breaking the enemy's line' in a naval battle. Visiting London the following year, he had some conferences on the subject with naval officers, among whom was Sir Charles Douglas, Lord Rodney's captain of the fleet in the memorable action of April 12, 1782, when the experiment was tried for the first time, and a decisive victory gained over the French. The principle was adopted by all British admirals, and led to many signal naval victories. In 1782, C. printed 50 copies of his *Essay on Naval Tactics*, for private distribution among his friends. It was reprinted and published in 1790; the 2d, 3d, and 4th parts were added in 1797; and the work was republished entire in 1804, with a preface explaining the origin of his discoveries. The manœuvre was claimed by Sir Howard Douglas for his father, Admiral Sir Charles Douglas, but C.'s right to it is indisputable. He died May 10, 1812.—His son, JOHN CLERK (Lord Eldin), an eminent Scottish judge, born in April 1757, was educated for the profession of the law, and in 1785, was admitted advocate. Distinguished for great clearness of perception and admirable powers of reasoning, he had for many years the largest practice at the Scottish bar, and in 1823 was raised to the bench, when he assumed the judicial title of Lord Eldin. He possessed a quaint sarcastic humour, and a coarse but ready wit, which, with his lameness and other bodily peculiarities, rendered him one of the most remarkable Edinburgh characters of his time. He died in that city in June 1832.

**CLERK**, PARISH, an official in the Church of England, who leads the responses in a congregation, and assists in the services of public worship, at funerals, &c., but is not in holy orders. There is usually one in each parish. In cathedrals and collegiate churches, there are several of these lay-clerks; and in some cases they form a corporate body, having a common estate, besides payments from the chapter. Before the Reformation, the duties were always discharged by clergymen.

**CLERK TO THE SIGNET.** See WRITER TO THE SIGNET.

**CLERMONT** (in the middle ages, *Clarus Mons*, or *Clarimontium*) is the name of several towns in France. The most important is the capital of the department of Puy-de-Dôme, Clermont-Ferrand (the *Augustonemetum* of the Romans, in the country of the Arverni), which is finely situated on a gentle elevation between the rivers Bedat and Allier, at the foot of a range of extinct volcanoes, crowned by the peak of Puy-de-Dôme, about five miles distant from the town. It consists of the two towns of C. and Montferrand, upwards of a mile distant from one another, and connected by a fine avenue of trees. C. contains several remarkable buildings: the old Gothic cathedral, the Corn and Linen Hall, the Theatre, and the Hôtel-dieu or Hospital. C. has several educational and scientific institutions, and a public library, in which are preserved some curious MSS. The population amounts to 30,000, who carry on the manufacture of linen, woollen cloth, hosiery, paper, &c., and an extensive traffic in the produce of the district, and in the transit trade between Paris and the south of France. There are two mineral springs in the town, which are used for bathing. That of St Alyne is most remarkable, having deposited in the course of ages an immense mass of limestone; and the deposit at one part forms over a rivulet a natural bridge 21 feet long. The whole district abounds in such springs. A multitude of Roman antiquities attest the Roman origin of the city. In the middle ages, C. was the residence of the counts of the same name, and became the seat of one of the oldest bishoprics of France. Several ecclesiastical councils were held here, the most remarkable of which was that in 1095, at which the first Crusade was instituted by Urban II. A statue has been erected to Pascal, who was a native of Clermont.

**CLERMONT-DE-LODEVE**, a town in the department of Herault, 23 miles west-north-west of Montpellier, agreeably situated on the declivity of a hill, crowned by the ruins of an old castle. It has extensive manufactures of woollen cloth. Pop. 5850.

**CLE'RUS**, a genus of insects of the order *Coleoptera*, section *Pentamera*, and of the great family or sub-section *Serricornes.* They are beautiful beetles, generally found on flowers, and often on those of umbelliferous plants, but their larvæ feed on the larvæ of different kinds of bees: those of *C. apiarius*—a rare insect in Britain, but common in some parts of Europe—on the larvæ of the hive-bee. It is about half an inch long, greenish, the wing-cases scarlet with purplish blue bands. How the larvæ of this and other insects should be able to carry on their ravages with impunity in a bee-hive, has never yet been satisfactorily explained.

**CLE'VELAND** (Cliff-land), a wild mountainous district, with some picturesque fertile valleys, forming the east part of the N. Riding of Yorkshire between Whitby and the Tees. It includes Gisborough, Stokesley, and the Moors. It is 30 miles from east to west, by 15 from north to south. Geologically, it consists of inferior oolite, but the coast and west border are formed of lias. In the middle is Roseberry Topping Hill, 1022 feet high; and in the south, the hills rise 1300 to 1850 feet. C. includes the sources of the Esk and Rye, and also some of those of the Tees and Swale.

**CLEVELAND**, next to Cincinnati the most commercial city in Ohio, stands on the south shore of Lake Erie, at the mouth of the Cuyahoga, in lat. 41° 30′ N., and long. 81° 47′ W. The harbour, which is formed by the river, is naturally one of the best on the coast; and has been rendered still more available by the extending of a pier on either side into deeper water. By means of this secure and commodious haven, C., with the aid of artificial works in both directions, has navigable communications with the Atlantic Ocean on the one hand, and with the head of Lake Superior on the other; while to the south it connects itself with the basin of the Mississippi and the Gulf of Mexico through a canal which enters the Ohio at Portsmouth, about 200 miles below Pittsburg. In addition to all these facilities by water, C. is the terminus of railways converging from every quarter but the north. With so many advantages in its favour, this the principal outlet of its own half of one of the most flourishing states in the Union, could hardly fail to grow and prosper. C. was founded in 1796; but it does not appear to have attained anything like its present rate of progress before 1840. Between that year and 1850, the population increased from 6071 to 17,034; while the latter number was estimated, at the close of three years more, to have swollen to 25,000. As far back as 1851—when its census could hardly have amounted to one-half of that of 1860—the imports and exports together were officially valued at about 14,000,000 dollars. Besides its full share of the ordinary features and appliances of a wealthy and intelligent city, C. has erected, at the cost of about 400,000 dollars, magnificent works for supplying its inhabitants with pure water from Lake Erie, the difference of level being fully 100 feet.

**CLEVES** (Ger. *Kleve*), a town of Rhenish Prussia, 48 miles north-west of Düsseldorf. It is situated on three gentle elevations, about 2½ miles from the Rhine, with which it communicates by canal, in the midst of a rich and beautiful country. It is divided into an upper and a lower town, is well built, in the Dutch fashion, and surrounded by walls. It has a fine old castle, partly built on a commanding rock, in which Anne of Cleves, one of the wives of Henry VIII., was born, and which is now converted into public offices. In the collegiate church, which dates from the 14th c., are some good monuments to the counts of Cleves. C. has manufactures of woollen and cotton fabrics, silks, hosiery, tobacco, &c. Pop. 7500. C. was anciently the capital of a duchy extending along both banks of the Rhine, and which passed by marriage to the reigning House of Prussia.

**CLEW** is a name given to the lower corner of square sails, and the aftermost lower corner of stay-sails. *Clew-lines* are the names of ropes for managing these corners; *clew-garnets* are only applied to the *courses*, or largest sails of a ship; and to *clew-up*, is to haul up the C. of a sail.

**CLEW BAY**, an inlet of the Atlantic, on the west coast of Mayo county, Ireland, 15 miles deep by 8 broad. Some of the mountains on the north rise 1200 to 2500 feet, but the land on the east is lower, and leads to Westport, Newport, and Castlebar. Old red sandstone, carboniferous limestone, and Cambrian strata form the shores of the bay, which are generally bold and rocky, but have many small harbours and fishing-stations. The upper part of the bay contains an archipelago, 300 fertile and cultivated islets. At the entrance of the bay is Clare Isle, 4½ by 2 miles, composed of old red sandstone and Cambrian rocks, and rising 1520 feet.

**CLICHÉ** (Fr.), the impression made by a die in melted tin, or other fusible metal. It is the proof of a medallist's or die-sinker's work, by which they judge of the effect, and ascertain the stage of progress which they have reached before the die is hardened. The same term is applied by the French to stereotype casts from wood-cuts.

**CLICHY**, a town of France, in the department of Seine, about four miles north-west of Paris, of which it forms a suburb. It has manufactures of white-lead and chemical products. Pop. 9000.

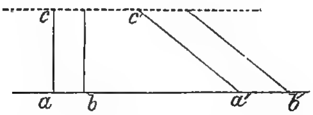
**CLI'CK-BEETLE**, the popular name of many species of coleopterous insects of the tribe *Elaterides* (see ELATER), the parents of the destructive larvæ too well known to farmers by the name of WIRE-WORMS (q. v.). They derive the name C. from the sound which they make when, being laid on their back on any hard substance, they regain their feet by a spring, in the manner characteristic of the tribe to which they belong. The British species are numerous, the largest not quite half an inch long; none of them brilliantly coloured; all very similar in form, rather elongated, and the thorax and abdomen nearly of equal breadth throughout. SKIP-JACK is another popular name for them. The Striped C. (*Agriotes* [*Cataphagus* or *Elater*] *lineatus*) is the parent of a very destructive kind of wire-worm. The perfect insect is very abundant in the earlier part of summer in cornfields, hedges, &c. Other species are also found in great numbers, and it by no means appears that the ravages of the wire-worm are to be ascribed to any one or two species in particular.

**CLI'ENT.** See AGENT AND CLIENT. See also PRINCIPAL AND AGENT, PATRON, COUNSEL.

**CLI'FTON**, a beautiful and favourite watering-place in the south-west of Gloucestershire, forming the western suburb of Bristol. It is built on the sides and top of a carboniferous limestone hill, 308 feet high; commands fine picturesque views; and is separated from a similar cliff by a deep chasm on the south, through which flows the navigable Avon. The rock abounds in fossils and quartz, or Bristol stones. It has tepid springs of 73° F., which contain much carbonic acid and salts of magnesia, and were brought into notice about 1695. At the time of the great Lisbon earthquake, these waters became red; and the Avon, which rises here 35 feet at high-water, suddenly turned back. On Clifton Down are the remains of a Roman camp, 510 by 300 feet. See BRISTOL.

**CLIMA'CTERIC YEAR.** It was long believed that certain years in the life of man had a peculiar significance to him, and were the critical points, as it were, of his health and fortunes. The mystical number 7 and its multiples (e.g., 35, 49) constituted crises of this kind. The most important of all was the 63d year, called, by way of eminence, the 'climacteric year' or 'grand climacteric,' which was supposed to be fatal to most men; its influence being attributed to the fact, that it is the multiple of the two mystical numbers 7 and 9.

**CLI'MATE** (from the Greek *klima*, a slope or inclination, afterwards applied to a tract of country, with reference to its supposed inclination to the pole, and the effect of the obliquity of the sun's rays upon the temperature), a term now employed as including not merely the conditions of a place or country with regard to temperature, but also its meteorological conditions generally, in so far as they exercise an influence on the animal and vegetable kingdoms. The effect of the sun's rays is greatest where they fall perpendicularly on the surface of the earth, and diminishes as their obliquity increases; the surface which receives any given amount of the sun's rays increasing with their increased obliquity, as *a'b'* is greater than *ab* in the annexed figure; whilst at the same time the oblique rays being subjected to the influence of a greater number of particles of the atmosphere, as *c'a'* is longer than *ca*, a greater amount of their heat is absorbed before they reach the surface of the earth at all. The greater or smaller extent of surface receiving a certain amount of heat, also makes important differences to arise from *exposure* by slope towards the equator or towards the nearest pole. *Elevation* is a most important cause of differences of climate. As we ascend from the level of the sea to the greatest mountain altitudes, even at the equator, the temperature gradually diminishes, owing to the diminished density of the atmosphere, and we reach a region of perpetual snow, as in approaching the poles. The progressive diminution of the temperature is, however, affected by many other causes, so that the line of perpetual snow is far from being at the same elevation in all places of the same latitude. Thus, the snow-line on the southern side of the Himalaya is depressed by the moisture of the aërial currents from the Indian Ocean; and that on the northern side is elevated by the radiation of heat in the vast dry table-lands of Central Asia, and the consequent ascending streams of warm dry air; so that the difference between the two is not less than 4000 feet in favour of the *northern* side of the mountain-ranges; and Humboldt says, 'millions of men of Tibetian origin occupy populous towns in a country where fields and towns would, during the whole year, have been buried in snow, if these table-lands had been less continuous and less extensive.' As the actual temperature of the atmosphere depends not so much upon the direct rays of the sun as upon the radiation from the heated surface of the earth, the diversities in the character of that surface are productive of great effects in modifying climate. A sandy desert, a tract of country clothed with luxuriant vegetation, and an expanse of water, absorb and radiate heat in very different degrees. A newly ploughed field both absorbs and radiates heat much more rapidly than a field covered with grass. A sandy desert heats the atmosphere above it much more than either a fertile tract or a watery expanse, and a watery expanse still less than a fertile tract; but, on the other hand, the desert cools sooner by radiation; whilst the heat absorbed by the water being diffused through a larger mass—partly by reason of the motion continually taking place in the fluid substance—and affecting greater depths, the influence of the ocean, of seas, and of great lakes, is very powerful in maintaining a greater equality in the temperature of the atmosphere. Thus maritime places, and particularly islands and peninsulas, have a more equal temperature, with less diversity of the extremes of summer and winter, than more inland or continental places otherwise similarly situated. The effect of the sea is modified by many circumstances, and particularly by currents, of which the Gulf Stream (q. v.) affords a notable instance, the heated water conveyed by it from the equatorial to the polar regions having a great influence on the C., particularly of the north-west of Europe. The temperature of Europe is also in part dependent on the warm south winds, which have absorbed heat from the great sandy deserts of Africa; and over the world generally, atmospheric currents must be regarded as exercising even a greater influence on C. than oceanic currents. The quantity of rain or snow that falls in the course of a year, and the times and manner of its falling, are circumstances which have a great effect on climate. These are circumstances much influenced by the distribution of land and water, and by the elevation and character of the surface of the land, which, doubtless, also influence electric and other meteorological conditions, less understood, but certainly not unimportant.



The relations of C. to vegetation are determined not merely by the mean annual temperature, but in a great measure also—and, with regard to many plants, entirely—by the duration and C. of summer. Thus, maize, which may be mentioned as an important example, succeeds well in climates of which the winter-cold is severe, the summer season alone being sufficient for its whole life; whilst, on the other hand, such plants as fuchsias, some kinds of laurel, and even the common hawthorn, which succeed well enough where maize would scarcely put forth an ear, would perish from the colder winters of countries where it is profitably cultivated. The polar limit of particular species of animals, except those which hybernate, is generally determined by the degree of winter-cold which they can bear without injury.

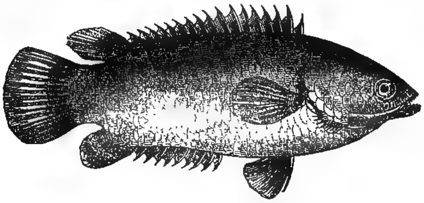
Bogs and marshes exercise an unfavourable influence on C., cooling the air and causing fogs, as clay-soils also to some extent do, through their retentiveness of moisture; whilst marshes of some kinds, and in some situations, abound in exhalations very unfavourable to health. Similar remarks apply to large tracts of forest. The clearing, drainage, and cultivation of land have generally favourable effects on C.; although plantations are often beneficial for shelter; and a too complete removal of natural forests may prevent the deposition of moisture from the atmosphere to such a degree as to cause droughts, a result strikingly exemplified in some of the smaller West India Islands, and the tendency to which is said to be manifested on the great scale in the eastern part of the continent of North America.

The important and difficult subject of C. will be found further elucidated in some of the principal geographical articles, and in the articles AGRICULTURE; ARBORICULTURE; ATMOSPHERE; METEOROLOGY; MONSOONS; RAIN; SEASONS; STORMS; TRADE-WINDS; WINDS.

**CLI'MAX**, a Greek word signifying primarily a *stair*, and in Rhetoric, that artifice which consists in placing before the mind of the reader or hearer a series of propositions or objects so arranged that the least forcible strikes it first, and the others rise by successive gradations in impressiveness.

**CLIMBERS** (*Scansores*), in Ornithology, an order of birds generally characterised by having two toes before opposed by two toes behind, so as to adapt their feet in a remarkable degree for the purpose of grasping the branch of a tree or any similar object. Many have not two toes permanently directed backwards, but have the power of turning one of the front toes backwards at pleasure. Some have only three toes, but yet on other accounts are unhesitatingly ranked in this order. The families of the C., however, differ very much in many respects, although agreeing in the structure of their feet. To this order belong parrots, toucans, trogons, barbets, woodpeckers, and cuckoos. It has been objected to the name C., that although very descriptive of the habits of some birds of this order, as woodpeckers, it is not very applicable to others, as cuckoos, whilst there are birds of other orders, as creepers, which possess this habit in the greatest degree; and the name has been changed by some ornithologists into *Yoke-footed* or *Zygodactylous Birds.* It is generally the outer front toe which is directed backward in this order; but in the trogons, the first and second toes are opposed to the third and fourth.

**CLIMBING PERCH** (*Anabas scandens*), the only well-ascertained species of a genus of fishes, from which the family *Anabasidæ* (q. v.) derives its name. It is a native of rivers and ponds in most parts of the East Indies. It is about six inches long. In general form, it somewhat resembles a perch, and the resemblance is increased by the large scales and the spiny dorsal fin. That this fish climbs trees, has been asserted by observers whose veracity and accuracy cannot easily be questioned; yet others, who have enjoyed ample opportunity of observation, express great doubt concerning this habit. In climbing, the fish is said to suspend itself by its spiny gill-covers, and by fixing its anal fin in cavities of the bark, urging its way upwards by distending and contracting its body. There is no doubt that it often leaves pools when they are in danger of being dried up, and travels in search of water. Though these fish are sometimes compelled in their distress to travel by day, and have been met in the glare of noon toiling along a dusty road, their migrations are generally performed at night or in early morning, whilst the grass is still wet with dew. Climbing perches are plentiful in the Ganges, and the boatmen have been known to keep them for five or six days in an earthen pot without water, using daily what they wanted, and finding them as lively as when just caught.


Climbing Perch.

**CLIMBING PLANTS**, or **CLIMBERS**, are, in the most extensive and popular sense of the term, those plants which, having weak stems, seek support from other objects, chiefly from other plants, in order to ascend from the ground. This, however, is accomplished in very different ways. Some climb by means of small root-like processes growing from the stem, as the ivy; some by means of *cirri* or tendrils, which twine round branches of trees, &c. (see CIRRUS); some by adhering disks, of which a beautiful instance is to be seen in the well-known Virginian Creeper; and many by the twining of their own stems around those to which they cling. Twining plants generally turn only in one direction, either from right to left, or from left to right. The scarlet-runner and passion-flower are examples of the former; the honeysuckle and hop of the latter. Twining plants are not always included under the designation climbing plants. The woody twining plants, which form one of the most remarkable features of tropical forests, are often called *Lianas* (q. v.).

**CLI'NCHER-BUILT**, or **CLINKER-BUILT**, is a name applied in Ship-building, when the lower edges of the side-planks overlap the row next under them, like slates on the roof of a house. If the planks are all smooth, meeting edge to edge, the construction is called *carvel-built.* This construction requires that the seams should be very close, and calked with oakum. Boats are often *diagonal-built;* two layers of planking, rising in opposite directions from the keel at an angle of 45°. In iron ships, the clincher arrangement is called *lap-jointed,* and the carvel arrangement, *jump-jointed.*

**CLI'NIC BA'PTISM** (Gr. *klinē*, a bed), in the ancient church, baptism administered to a person on a sick-bed or death-bed. The practice and the term alike indicate notions concerning baptism which have no foundation in Scripture, and which, although once extremely prevalent, have now almost entirely disappeared.

**CLINIC ME'DICINE**, is that department of the art which is occupied with the investigation of diseases at the bedside, or individually.

**CLI'NKSTONE**, or **PHO'NOLITE**, is a grayish green felspathic rock, remarkable for its tendency to lamination, which is sometimes such that it affords tiles for roofing. It is a compact homogeneous rock, passing gradually into gray basalt. The slabs give a metallic ring or 'clink' when struck with a hammer, whence its name. It occurs in volcanic districts.

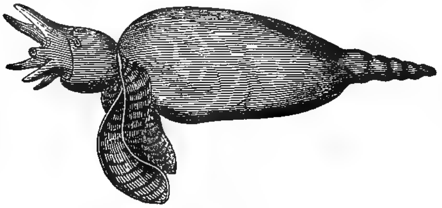
**CLINO'METER**, an instrument for the purpose of taking the dip and strike of a stratum. It consists of a compass provided with a small spirit-level, and on the lid—which can be fixed at right angles to the compass-box—there is a small graduated quadrant, and a plumb-line.

**CLI'NTON, DE WITT**, an American statesman of English origin, son of a major-general in the United States army, and descended, on his mother's side, from the Dutch family of De Witt, was born in 1769, at Little Britain, state of New York. Being admitted to the bar, he became private secretary to his uncle, General George Clinton, till the end of his administration in 1785. In 1797, he was elected a member of the New York legislature, and in 1801, chosen a senator of the United States. Subsequently, he was elected mayor of New York, from which office the violence of political parties occasioned his retirement in 1815. Between 1817 and his death in 1828, he was repeatedly governor of New York state. The formation of the great canal from Lake Erie to the Hudson was mainly owing to his persevering endeavours. He was a member of most of the literary and scientific institutions of the United States, and of several of those of Great Britain and the continent of Europe. Besides various fugitive pieces, his productions consist of speeches, governor's messages, discourses before various institutions, addresses to the army, communications regarding Lake Erie Canal, and judicial opinions.

**CLINTON,** Henry Fynes, a very distinguished classical scholar, was born January 14, 1781, at Gamston, in Nottinghamshire; educated at Southwell School, and afterwards at Westminster. In 1799, he went to Oxford, and in 1805 took his degree of M.A. Next year, he entered parliament as member for Aldborough, which he continued to represent until 1826. He died October 24, 1852. C.'s two great works are the *Fasti Hellenici* (1824—1834), and *Fasti Romani* (1845—1850). They are known to all European scholars, and contain an immense store of learning.

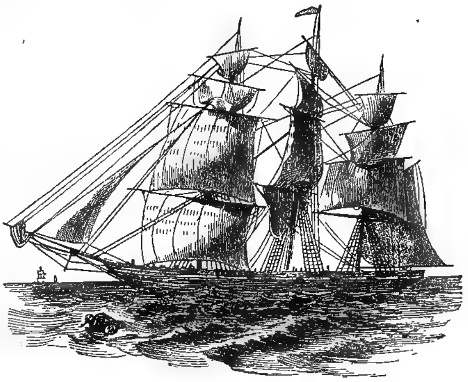
**CLI'O,** in Grecian mythology, the daughter of Jupiter and Mnemosyne, the mother of Hyacinthus and Hymenæus. She was the Muse of History and Epic Poetry, and was represented as bearing a half-opened roll of a book.

**CLIO,** a genus of shell-less Pteropodous mollusks, of which one species, *C. borealis*, is extremely abundant in the Arctic seas, and constitutes a principal part of the food of whales, so that indeed the name *whale's food* is often given to it by whale-fishers. It is scarcely an inch long; the head is furnished with six retractile tentacula; the organs of locomotion are two delicate fins, attached to the neck, and which in swimming are brought almost into contact, first above, then below. It is an active little creature, often coming for an instant to the surface of the water in calm weather, and then suddenly diving away into the depths. Myriads are seen together, and the water is sometimes so full of them, that a whale cannot open its mouth without engulfing them in great numbers. *C. australis* is almost as abundant in the southern seas as *C. borealis* in the northern.



Clio Borealis.

**CLIPPER,** is a name familiarly given to a ship built expressly for speed. The requirements of trades in which the merchandise carried was of a perishable nature, and rendered a quick passage desirable, were probably among the first causes which directed scientific attention to the *lines* of vessels for the purpose of ascertaining the form adapted to offer least resistance to the water. For many years the fruit-clippers have been celebrated for their rapid passages; and the opium-clippers, and slavers, have attained an unenviable notoriety for speed. The modifications of the old form of vessel have been gradual, the desideratum aimed at being the combination of the greatest carrying capacity with the form best adapted for speed. Perhaps the most successful improvements have been those of the Aberdeen builders, the Americans, and Mr Scott Russell. A C., as compared with an ordinary sailing-ship, is longer and narrower (though of late the tendency has been to increase the beam); very sharp at the bows, which are generally hollowed more or less below the water-line; gracefully fined away towards the stern, which is usually elliptical; and, altogether, presenting the contrast of the race-horse to the beast of burden. Some of the C. ships now running from Liverpool to America and to Australia are among the most magnificent vessels in the world. The *Lightning,* during a voyage from Melbourne to Liverpool, ran 2550 English miles in one week, or at the rate of 15½ miles an hour during the whole period. The Americans have fully done their part in introducing rapid C. ships, both for ocean and for river navigation, for steamers and for sailing-ships.



English Clipper.

**CLIPPING THE COIN.** See Coin.

**CLI'THEROE,** a parliamentary and municipal borough in the west of Lancashire, on the left bank of the Ribble, 28 miles north of Manchester. It lies on a low eminence of carboniferous limestone, at the base of Pendle Hill, which is 1803 feet high. Pendle Forest is celebrated as the locality of the exploits of the Lancashire witches. The main street runs along the ridge of the eminence, and at its south end are the ruins of a castle, founded in the time of William Rufus by the Lacys. C. has print-works, cotton-manufactures, and limekilns. It sends lime to all parts of the kingdom. About 5 miles west of C., lies Stonyhurst College, the principal seat of the Jesuits in England. Pop. of the parliamentary borough, 11,480. It returns one member to parliament.

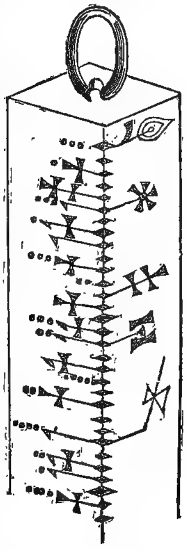
**CLIVE,** Robert, Lord, Baron of Plassey, one of the greatest warrior-statesmen of whom England can boast, the founder of British supremacy in India, was born at Styche, in Shropshire, 1725. At school he exhibited little aptitude for learning, but was noted for his mischievous propensities and his fearless disposition. The monotony of a clerkship in the India Civil Service at Madras, where he arrived in 1744, had literally nearly been the death of him; it was with great joy, therefore, that he abandoned the pen for the sword, when some three years after his arrival the troubles accumulating upon the English in India gave him an opportunity of doing so. C. had now found his true sphere. The bold, fearless character had now scope enough for its development; the intellect which, chained to the desk, had seemed of the dullest and most commonplace kind, in the freedom of the field became at once quick, comprehensive, and original. When C. grasped the sword, English influence in India was almost extinct; the French and their allies had scarcely left them even a material footing. Yet in less than half-a-dozen years after C. had, in August 1751, with 200 English infantry and 300 sepoys, marched out of Fort St David on his hazardous enterprise to attack Arcot, a city of 100,000 inhabitants, and garrisoned by 1200 or 1500 of Chunda Sahib's best troops, amply supplied with artillery, the decisive battle of Plassey had been fought, and English power established on the ruin of that of France and the native princes. The daring displayed in the capture of Arcot, and the intrepidity and fortitude exhibited in its defence by C. and his little band, reduced to 200 men, against an army of 10,000, was the foundation of England's subsequent greatness and glory in India. C.'s name henceforward was a tower of strength in India, where he was surnamed by the natives *Sabat Jung*, or 'the Daring in War.' Victory marched with him alike against native warriors, French, and Dutch. Unscrupulous as to his means, he would undoubtedly have found himself involved in many difficulties had not his questionable actions been invariably crowned, and thus—in the lax political notions of the time—justified, by success. Nothing remaining for him to do in India, he returned to England in 1760, and received the warm thanks of the Company and an Irish peerage from the government for his services. His wealth, arising from shares in various spoils, presents and grants of territory from native princes, was enormous. After his departure from India, the Company's affairs, through the dishonesty of its servants, high and low, fell into a state of the greatest confusion, and C., in 1764, was chosen to set them right. He proved himself as competent an administrator as he was a warrior. Uncompromising and resolute, he bore down every opposition to his plans, all the more sternly that he found it in some cases assuming the form of threats. In less than 18 months, he had 'restored perfect order and discipline in both the civil and military services, and brought back prosperity to the well-nigh ruined finances of the Company.' He returned to England in 1767, and was received with the distinction to which his important services entitled him. But the energetic way in which he had righted matters in India, gave offence to those who suffered from the suppression of dishonest practices, many of whom were not without considerable influence in the mother-country. This influence they employed to stir up ill-feeling against C.; and his proceedings in India were made the subject of animadversion in parliament in 1772, and in the following year, matter for the inquiry of a select parliamentary committee; who, however, failed to find that C. had acquired his great wealth by abuse of power, as his enemies had asserted. The form of acquittal, however, was not quite satisfactory to C., who never got over the disgrace implied in the trial; and ended his life by suicide, November 22, 1774.

**CLÖA'CA.** See the article Birds. A similar anatomical arrangement is found in one order of mammals, the monotremata (q. v.), in all reptiles, and in many fishes.

**CLOACA MA'XIMA.** This was a subterranean passage of vast extent, by which the whole, or a great part, of the filth of ancient Rome was conveyed to the Tiber. Drains from the lower parts of the city around the Forum, and from the other valleys, were commenced by Tarquinius Priscus; but the construction of the C. M. is attributed by Livy to Tarquinius Superbus. Niebuhr is of opinion, that it was at first intended to drain the valley of the Forum; but it appears to have been subsequently extended, and connected with the smaller cloacæ. Running from the Forum past the temple of Vesta, it terminated at the Tiber, where the mouth of it is still visible. It consisted of three large arches, one within the other. The space enclosed by the innermost vault was upwards of 13 feet in width, and of a corresponding height. The arches were built of large blocks of stone, fixed together without cement, of the uniform size of rather more than 5 feet 5 inches long and 3 feet high. The species of stone used bears evidence to the antiquity of the construction, being the material which was employed in the most ancient public edifices. The sewer was kept in a state of efficiency by a continual stream of superfluous water from the aqueducts. Large portions of this and of the other cloacæ remain, in some places still visible, but generally buried, by the accumulation of soil, at a considerable depth below the present level of the streets. During the Republic, the surveillance of the Roman cloacæ was one of the duties performed by the censors. The C. M. was subjected to repair by Cato and his colleague in the censorship. Agrippa, when ædile, obtained praise for his exertions in cleansing and repairing the cloacæ, and is recorded to have passed through them in a boat. Under the empire, officers called *curatores cloacarum urbis* were appointed for their supervision. So thoroughly was the city undermined by these large sewers, that Pliny calls it *urbs pensilis*, a city suspended in the air rather than resting upon the earth. Drains of the same description, but of smaller dimensions, existed in some others of the ancient Roman cities.

**CLOCK BE'LL-METAL** is principally an alloy of copper and tin, with smaller quantities of bismuth, antimony, lead, and zinc. A common alloy is 80 parts of copper, 10 tin, 5½ zinc, and 4½ lead. The bismuth and antimony make the bell more brittle, but they communicate a better tone; and where the proportion of tin rises as high as 20 per cent., or 1 part of tin to 4 of the other metals, a very much more sonorous bell is obtained.

**CLOCKS AND WATCHES.** See Horology.



Clog Almanac for month of January.

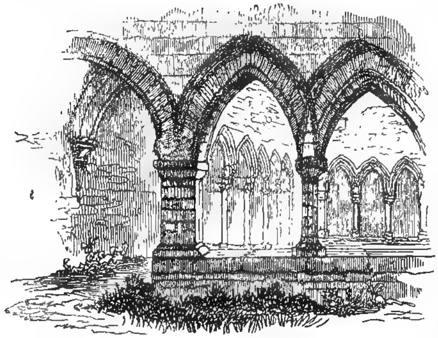
**CLOG A'LMANAC,** the name given in England to a primitive kind of calendar or almanac, called also a 'rim stock' and 'prime staff.' In Scandinavia it was called a 'Runic staff,' from the Runic characters used in its numerical notation. It was generally of wood (whence its name of 'clog,' *i. e.*, log or block), but was sometimes of brass, of bone, or of horn. When of wood, it was most commonly of box; but elm, fir, and oak, were also employed. 'This almanac'—says Dr Plot, in his *Natural History of Staffordshire*, written in 1686, when it was still in use among the common people of that county—'is usually a square piece of wood, containing three months on each of the four edges. The number of days in them are expressed by notches: the first day by a notch with a patulous stroke turned up from it, and every seventh by a large-sized notch. Overagainst many of the notches are placed on the left hand several marks or symbols, denoting the golden number or cycle of the moon. The festivals are marked by symbols of the several saints issuing from the notches. Some are perfect, containing the dominical letters as well as the prime and marks for the feasts, engraven upon them, and such are our primestaves in the Museum at Oxford: others imperfect, having only the prime and the immovable feasts on them, and such are all those I met with in

Staffordshire; which yet are of two kinds also, some public, of a larger size, which hang commonly here at one end of the mantle-tree of their chimneys, for the use of the whole family; and others private, of a smaller size, which they carry in their pockets.' Examples of the C. A. may be seen in the British Museum (one cut apparently towards the end of the 17th c.); in the Ashmolean Museum, and the Bodleian Library, at Oxford; in St John's College, Cambridge; and in the Cheetham Library, at Manchester. The Flemish antiquary, Gruter, delineates one at Rome, which he believes to have been used by the Goths and Vandals; but there is no reason to suppose that the C. A. was known to any European nation before its conversion to Christianity. It is described by the Swedish historian, Olaus Magnus, in the 16th c.; and by the Danish antiquary, Olaus Wormius, in the 17th c. It has been found in France and elsewhere. In Denmark it seems to have been generally flat, divided into six columns; but six-sided examples are not unfrequent. Some of the clog almanacs shew a peculiar numerical notation. The first four digits are marked by dots; the fifth, by a sign like the Roman numeral V; the next four, by this sign and additional dots; and the tenth, by the sign +.

**CLOGHEE'N**, a town in the south-west of Tipperary county, 14 miles west-south-west of Clonmel, in lat. 52° 17′ N., and long. 7° 57′ W. Pop. 2884. The rich limestone soil of Tar vale produces fine wheat crops, and there are extensive flour-mills here. Six miles north-west of C. are the famous limestone caves of Mitchellstown, with beautiful limestone concretions. The caves consist of galleries and vaults, 800 by 570 feet.

**CLO'GHER**, a decayed episcopal city of Ireland, in the south of Tyrone, on the Launy, a tributary of the Blackwater, 104 miles north-north-west of Dublin. The see has lately been united to that of Armagh. St Patrick is said to have been the first bishop of C., in 444. Pop. 1000.

**CLOI'STER** (Fr. *cloître*, *claustrum*, an enclosure), a covered passage, or ambulatory, running round the walls of certain portions of monastic and collegiate buildings. The C. usually surrounded, or ran along three sides of a quadrangular area, which was called the *C. garth.* The roof of the C., which was often vaulted, was supported on the side next to the quadrangle by pillars and arches, which were frequently ornamentally combined like trifolial arches, and, like them, occupied by tracery. The upper portions of these arches above the mullions were often glazed; and sometimes latterly even the whole arches, so that they became a row of windows, as at Gloucester. Cloisters were used for exercise and recreation by the inmates of the religious houses. Occasionally, when wholly glazed, they had cells or stalls for study on the inner side; and very frequently a stone-bench may still be seen, which runs along the same side. Many of the larger monasteries had more cloisters than one; and so characteristic were they of the religious houses, that the term C. came to be used in a general sense for the whole establishment, which is still the sense of the word *kloster* in German. See MONASTERY.



Cloister:
Kilconnel Abbey.

**CLONAKI'LTY**, a town in the south of Cork county, Ireland, at the head of a small inlet, 26 miles south-west of Cork. Its chief export is grain. Pop. 3300.

**CLONES**, a market town of Ireland, in the county of Monaghan, 12 miles west from the town of that name. It is situated on a rising ground on the high-road between Monaghan and Belturbet, and near the Ulster Canal, and is in general well built, and has some ancient remains, including the ruins of a monastery, dating, it is said, from the 5th c., and of a round tower. It has manufactures of linen, corn-mills, and a brewery, and is the seat of a poor-law union. Pop. 2326.

**CLONME'L** (Vale of Honey), a parliamentary and municipal borough in the south of Tipperary county, with a little in Waterford, on both banks of the Suir, which here divides the counties, and on two isles on that river, 14 miles south-south-east of Cashel. It chiefly stands on the Tipperary or north side of the Suir, and on one of the isles in the river. One of the bridges over the Suir has 20 arches. The main street is a mile long, and parallel to the river. In the vicinity are mountains 1700 to 2800 feet high. Pop. 15,336. C. returns one member to parliament. It has manufactures of cotton, and large flour-mills. The chief exports are agricultural produce and cattle. Barges of 20 to 50 tons ply on the Suir to Waterford. C. had formerly walls, of which one gate remains. In 1650, Cromwell besieged the town, and demolished the castle. C. gave birth to Sterne and Lady Blessington, and was the chief scene of O'Brien's attempted rising in 1848. Here Mr Bianconi first established the cheap and rapid car travelling over the south-west of Ireland; and C. is now a great centre for Irish tourists.

**CLONTA'RF**, a town of Ireland, in the county of Dublin, about 3 miles east-north-east of Dublin city. It is much frequented during the summer months for sea-bathing, and there are many handsome villas in the vicinity. C. is celebrated in history as the place where, in 1014, Brian Boroimhe (q. v.) won a great victory over the Danes. Pop. stated at between 2000 and 3000.

**CLOOTS**, JEAN BAPTISTE, BARON, better known as Anacharsis Cloots, was perhaps the most singular of all the enthusiasts brought to the surface of society by the French Revolution. He was born near Cleves in 1755, and from his 11th year was educated in Paris. Through ardent study of the ancients, his imagination, naturally extravagant, became so heated with the political constitutions of Greece, that he undertook the mission of spreading the democracy of Sparta and Athens throughout the world; and with this view he travelled through most of the countries of Europe, under the name of Anacharsis, everywhere expending upon his philanthropic schemes large sums of his very considerable private fortune. The union of all nations in one family was the ultimate aim of all his cosmopolitan schemes. The breaking out of the French Revolution brought his enthusiasm to a head, as he saw in it the fulfilment of his dreams and plans.

He returned to Paris, constituted himself the 'orator or advocate of the human race,' and presented numerous petitions to the National Assembly. On the 19th of June 1790, he appeared at the bar of the Assembly at the head of a number of strangers, dressed in the costumes of different nations, as the representatives of the whole earth, and presented an address of thanks for the stand made against the tyrants of the world, and a request that all the strangers then in Paris should be made French citizens. As a member of the Constituent Assembly, he offered to raise a Prussian corps, to be called the Vandal Legion; proposed to lay a price on the head of the Duke of Brunswick; called the king of Prussia the Sardanapalus of the north; and eulogised Count Ankarstrom for having assassinated the king of Sweden. What is singular is, that these extravagances were received often with storms of applause. He called for the apotheosis of Gutenberg in the Pantheon, as the 'creator of the word,' and also for that of an apostate priest. On the occasion of the general armament of France, he deposited 12,000 francs on the altar of the country. In 1792 he was elected a member of the Convention, and continued to weary the house with his extravagant motions. He hated Christianity no less than royalty; declared himself the enemy of its founder; and, as an adherent of the worship of Reason, preached downright materialism. At the trial of Louis XVI., he gave his vote for death, 'in the name of the human race,' and took occasion at the same time to pass sentence on the king of Prussia. Some time after, on the motion of Robespierre, he was excluded from the Club of the Jacobins, on the ground that he was wealthy and a nobleman. Robespierre hated and feared the enthusiast; and when St Just brought his impeachment against Hebert and his adherents, C. was involved in it, was condemned to death, and executed March 23, 1794. He heard his sentence with the greatest composure, comforted the companions of his fate, and continued to preach materialism to his friend Hebert on the way to the place of execution. At the foot of the scaffold he requested that his turn might be last, in order that he might have time to establish a few more principles, while the heads of the others were falling. He then laid his head with equanimity on the block, after asserting his innocence, and protesting against his sentence, 'in the name of the human race.' He left a number of writings, all of the same extravagant character, of which we may mention here *Certitude des Preuves du Mohammédisme* (Lond. 1780), *L'Orateur du Genre Humain* (1791), and *Base Constitutionnelle de la Republique du Genre Humain* (1793).

**CLOSE**, in Heraldry. When the wings of a bird are down and close to the body, it is described as Close. The term is used only with reference to birds addicted to flight, such as the eagle, falcon, &c. Of dunghill cocks, and other domestic fowls, it is understood that their wings are in this position. Barnacles, and bits for horses, are said to be *close* when they are not to be understood as extended.

**CLO'SE-HAULED**, in Seamanship, is the mode in which the sails are arranged, in order to make the ship move in a direction the nearest possible towards that point of the compass from which the wind blows. Fore and aft vessels, especially cutters, sail closer to the wind than square-rigged ones. Ships of some sizes and shapes can attain this result better than others; but it is a quality scarcely to be calculated beforehand.

**CLO'SET**, in Heraldry, the half of the bar (q. v.).

**CLOTAIRE I. and II.**, kings of the Franks. See MEROVINGIANS.

**CLO'THES-MOTH**, a name common to a number of species of small moths of the genus *Tinea*, the larvæ or caterpillars of which are extremely destructive to woollen clothes, furs, stuffed quadrupeds and birds, &c. *Tinea destructor* is one of the most annoying of these insect pests. It is of a satiny buff colour, the wings deflexed when at rest. The larva is about a quarter of an inch long, with only a few hairs, white, with a slate-coloured line down the back, an ochreous head, and 16 legs. *T. tapezana* has the upper wings black at the base, the rest of the wing white. *T. sarcitella* is another very common species, of a silky gray colour; the head, thorax, and base of the superior wings white; the wings folded flat on the back when at rest. The larva is covered with scattered hairs. These moths are most abundant in the warmer seasons of the year, but their larvæ carry on their destructive operations even during winter. Guided by instinct, the female moth lays her eggs where the larvæ may find their appropriate food, consisting of substances indigestible to almost every other creature; and the larvæ, being furnished with minute but strong and sharp jaws, not only begin to eat as soon as they are hatched, but to cut the fibres of the substances on which they feed into little bits, and to unite them by means of a glutinous silk of their own producing, so as to form for themselves cases, lined internally with silk; and in these they constantly abide, adding to them at the anterior end as their own increase of size requires, and also widening them, by slitting them down the middle, and mending them with additional materials. All this may be beautifully observed by transferring the same moth-larva to different pieces of flannel in succession, of different colours. The larva of *Tinea tapezana* works its way through woollen stuffs in an arched gallery, carrying its little case with it. *T. pellionella* makes similar tunnels in furs. *T. granella* is destructive to books as well as to grain. See CORN-MOTH. The best means of preventing the ravages of moths are perfect cleanliness, frequent inspection of articles, and their exposure to light and air. Spirit of turpentine is used for killing them; the vapour arising from a sponge dipped in this liquid is fatal to such as it sufficiently reaches; they are also killed by the heat of a brisk fire or of an oven.

**CLOTHING, ARMY**, is one of the departments of the British military system into which, within recent years, much change and improvement have been introduced.

In the time of Henry VIII., the soldiers' dress was principally white, with green or russet for special corps. In Queen Elizabeth's reign, a sum of 1*s*. 8*d*. was allowed weekly for each soldier's clothing. The uniform then consisted of a cassock of Kentish broad-cloth, a canvas doublet, kersey stockings, trousers of kersey broad-cloth, neat's leather shoes, and holland shirt. In 1678, an infantry soldier's dress was valued at £2, 13*s*., and a dragoon's as high as £6, 10*s*. At one time, lords-lieutenant attended to the C. of the troops, each in his own county; but the duty was afterwards transferred to the state. Captains of companies clothed the men, stopped the money out of the pay, and made a profit on the transaction. The privilege afterwards passed to the colonels of regiments. The sum provided by the state every year was for the 'effective' strength of the regiment; and any vacancies put an additional sum into the pockets of the colonel. From 1746 to 1855, soldiers' pay was debited with 'off-reckonings,' as a means of paying for the clothes supplied to the men. Under this system, the colonel received from the state so much money annually for clothing his regiment, and then contracted with wholesale tailors for a supply on the lowest terms. In 1854, just before a change was made in the system, the colonel's profit, on the C. for a private in the line, was 15*s.* 3*d.* per man.

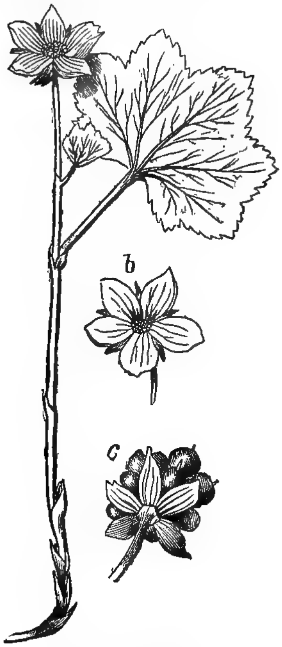
The disasters during the early months of the Crimean war having created a national demand for reforms in military matters, a change in the mode of army C. was one of the results. By a royal warrant, dated June 21, 1855, the colonels of regiments were awarded certain annual sums of money in lieu of off-reckonings. These sums varied from £1200 down to £500 a year, and were to be given in addition to the pay. From that date, all the Queen's troops have been clothed by the government, and not by the colonels, the off-reckonings being calculated nearly as before. When the War Office was remodelled, about the same time a clothing department was added to it; and it was now found that the C. for a full regiment of 1091 non-commissioned officers and rank and file, in the line, cost about £2500 per annum. The C. is now contracted for more openly than under the former system; and better materials are hence obtained without any increase in cost. The government has begun a factory on its own account, but the chief supply is still obtained by contract. Hitherto, soldiers' coats have been too often made of very loose spongy materials; but now the inspection is rendered much more severe; and the cloth provided for privates is as good as that worn by sergeants a few years ago. The cost of C. for the entire army in 1860—1861 was £575,000; of which £200,000 was to be repaid by the Indian government. This cost varies from £2, 6*s.* for a private in the line, to £8, 15*s.* for a life-guardsman. The charge to the soldier is now purposely made less than the cost to the government. The issue of new uniforms takes place on the 1st of April in each year. Under some circumstances, the men may receive money instead of C., at a certain price for each garment.

**CLOTHING**, Navy. The seamen of the royal navy are provided, while on the ship's books, with C. by the government; but a certain sum is subtracted from the pay, to defray the greater part of the cost. How much this amounts to, the Navy Estimates do not clearly state; for there is a clumsy grouping of 'clothing, tobacco, and soap' in one item. This item, for 1860—1861, was £380,000, of which £274,000 was to be refunded out of the men's pay. Cast-off seamen's C. is among the 'marine stores' sold by auction every year by the Admiralty. In 1859, when there was a strong desire to facilitate the manning of the navy, the Admiralty offered improved terms to sailors who would enter the royal service; and among other items, the following arrangements were made in reference to C.: 'To every man on his first entering the navy for ten years' continuous service, and to all boys on being advanced to man's rating, a suit of clothes consisting of the following made-up articles to be furnished free of charge: A blue cloth jacket (No. 2 cloth), 17*s.* 8*d.*; a pair of blue cloth trousers, do., 11*s.* 7*d.*; a blue serge frock, 8*s.* 6*d.*; a duck frock, 2*s.* 9*d.*; a pair of duck trousers, 2*s.* 7*d.*; a black silk handkerchief, 2*s.* 10*d.*; and a pair of shoes, 6*s.* 7*d.* In the case of a seaman being already provided with clothes approved by his captain, a corresponding amount in money is to be placed to his credit.' The above figures will about shew the market-value of the usual kinds of seamen's clothing.

**CLO'THO**, a genus of spiders, of which the only known species, *C. quinquemaculata*, a native of the south of Europe and north of Africa—about half an inch long, long-legged, brown, with black abdomen, marked with five yellowish spots—is interesting on account of its habits and the sort of tent which it spins for itself. This curious structure is in shape like a limpet shell, about an inch in diameter, and is fastened to the under side of stones or in crevices of rocks, not by its whole circumference, but by seven or eight points only. Within this the eggs are deposited in several bags of lenticular form. The parent creeps in and out under the edges of her tent, and supplies the young with food for some time.

**CLOUD**, St, a town of France, in the department of Seine-et-Oise, situated on the declivity of a hill near the Seine, 5 miles west of Paris. Its present name is said to be a corruption of St Clodoald, the name of a grandson of Clovis, who retreated to the little village of Novigentum, to escape the fury of his uncle, Clotaire, and became a monk. After his death, the village took the name of the pious prince, whose relics were sacredly preserved, and whose tomb was the scene of many miracles. St C. figures often in the wars of the middle ages. Henry III. was assassinated here in 1589, by the fanatical monk Jacques Clement. St C. is now famous on account of its magnificent château, built by Mazarin, and embellished by successive dukes of Orleans, who possessed it till 1782, when it passed into the hands of Marie Antoinette. Here Bonaparte, in 1799, was named First Consul, after he had dissolved the Council of Five Hundred, which had assembled within its walls; and in this place Charles X. signed the ordinances which produced the revolution of 1830, and lost him his throne. The park attached to the château is remarkable for its picturesque beauty, and its fine cascades and fountains. Pop. 3270.

**CLOU'DBERRY** (*Rubus Chamæmorus*), a plant of the same genus with the bramble, although of very different appearance, having a herbaceous single-flowered stem destitute of prickles. The plant is of humble growth, 8—10 inches in height;



Cloudberry:
*b*, the flower; *c*, the fruit.

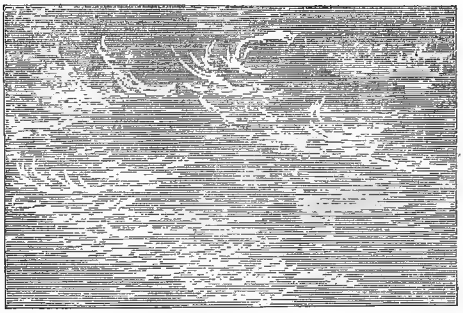
the leaves few, large, lobed, and somewhat kidney-shaped; the flower large and white, male and female flowers on separate plants, the female plant producing an orange-red fruit equal in size to a bramble-berry, and of an agreeable flavour. It is a native of the northern parts of Europe, Asia, and America. In Britain, it is chiefly confined to elevated moors; in Norway and Sweden, it is much more abundant, and the fruit is highly valued and made into excellent preserves. Unfortunately, the plant is of difficult cultivation, and no attempt to make it produce fruit freely in our gardens has yet been successful.—Somewhat similar to the C. is *Rubus geoides*, which yields a very agreeable fruit as large as a raspberry, one of the few native fruits of Terra del Fuego and the Falkland Islands.

**CLOUDS** are masses of fog, consisting of minute particles of water, often in a frozen state, floating in the atmosphere. When air saturated, or nearly so, with vapour, has its temperature lowered, either by ascending and becoming rarer, or by meeting a colder current, a portion of the vapour loses its gaseous form, and becomes condensed into minute specks of water. See EVAPORATION, DEW, RAIN, SNOW-LINE. A cloud, therefore, does not consist of vapour, in the proper sense of the word, but of water in the form of dust, as it were. How this water-dust is suspended in the atmosphere—why the particles do not descend as soon as formed, has never been satisfactorily explained. It has been assumed that the watery particles are hollow, like blown bubbles. But there is no proof of this; nor would the hollowness of the particles account for their floating, unless it could be shewn that they must be filled with a gas lighter than the surrounding air. Professor G. G. Stokes holds that they are prevented from falling mainly by the friction and drag of the air-particles, just as fine powders remain suspended in liquids of much less specific gravity than themselves. But, as Sir J. Herschel says, rising and horizontal air-currents must also oppose the fall of C.; for at night, in the absence of rising currents, they often descend to, and dissolve in lower and warmer levels. The conditions under which C. are formed, and afterwards deposited in rain, are more fully considered under EVAPORATION, DEW, RAIN, SNOW-LINE. The present article is confined to a description of the various kinds of C., and of the weather they indicate.

A general haze of precipitated vapour covering the sky, and coming down to the earth, is termed a *Fog* or *Mist;* and the term Cloud is usually confined to masses of fog floating in the higher regions, and not descending to the ground. They are mostly within a mile of the earth's surface; and none are more than five or six miles above it. They rise higher in the equatorial regions than towards the poles. C. spread and move with the wind in varied, often grand forms; they are generally disposed in beds parallel to the earth's surface; vertical C. occur rarely, if at all.

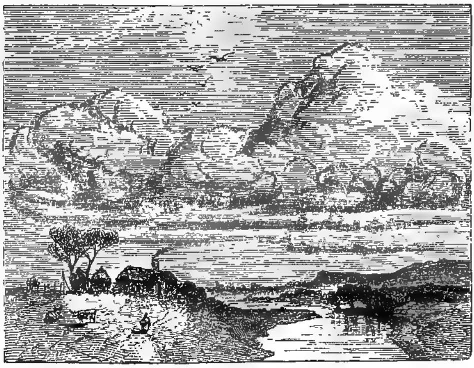
Mr Luke Howard's classification of C., proposed in 1802, into three primary forms—Cirrus (Ci.), Cumulus (Cu.), and Stratus (St.); three intermediate—Cirro-cumulus (Ci.-cu.), Cirro-stratus (Ci.-st.), and Cumulo-stratus (Cu.-st.); and one compound form, Nimbus (Ni.)—has been universally adopted, and holds good in all climates and atmospheric conditions.

*Cirrus*, or curl cloud, consists of parallel, curling, flexuous, diverging, and partly straight fibres, increasing in any or in all directions by elongation, branching, or addition of new fibres. It is the highest and least dense of C.; forms at least three miles above the earth; varies most in extent, direction, and shape; retains longest its varied outlines; and is the longest illuminated after sunset and before sunrise. It resembles a mare's or cat's tail, a lock of hair, fine trellis-work, or thin silvery streaks, and it may cover all the sky. Cirri seem to arise from the mixing of parallel air-currents, or are the relics of dissolving clouds drawn out in fibres by wind. Threads and groups of Ci., during gentle wind after severe weather, presage serene settled weather. But after a long tract of fair days, whitish filaments or parallel bands of Ci. crossing the sky, with the ends converging by perspective in each horizon, and travelling longitudinally, though seemingly stationary, foretell a change to wet. Ci., being so high, must consist of minute snow crystals, whose refractions and reflections produce the halos, coronæ, and mock suns and moons almost restricted to this cloud and its derivatives the Ci.-st. and Ci.-cu. The fibres often wave back and fore, or to and from each other. Ci., especially with fine tails, varying much in a few hours, presage rain or snow, and windy variable weather.



Cirrus.

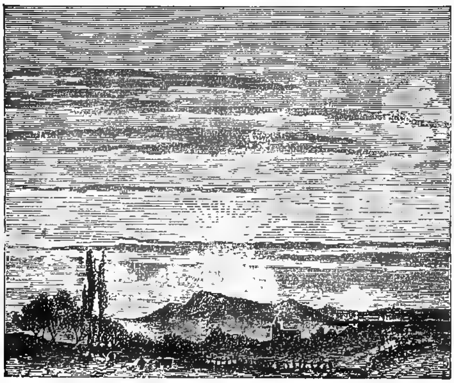
*Cumulus*, ball of cotton, day or summer cloud, consists of dense, convex, hemispherical, or conical heaps of small, roundish C., piled or stacked on each other. The heaps enlarge upwards from a horizontal base, and have crenated tops; they sometimes unite into stupendous white-topped mountains. It forms, says Sir J. Herschel, in summer calms by the rise of columns of vapour from marshes, lakes, and rivers, into the colder and quickly saturable lower regions of the air; for one liquid traverses another in cylinders. Cumuli begin after sunrise as a few scattered specks in



Cumulus.

the clear sky; these specks enlarge and unite to form C., which often nearly cover the sky in the afternoon, and generally decrease and vanish about sunset; but rain follows if they increase in number and darkness in the evening. Their tops become Ci. in very dry air. Cu., of pleasing forms, dispositions, and colours, and of moderate size, presage fine dry warm and calm days; but cold, rain, and tempest follow dark, abrupt, dense, shaggy Cu., covering the sky, and rolling on each other. Hemispherical, silvery white Cu. presage thunder.

*Stratus*, fall or night-cloud, the lowest of C., is a widely extended, horizontal sheet, of varied thickness, of white mist touching or near the earth. In density, it is between Ci. and Cu., and it increases from below. It is common in summer and autumn often from sunset to sunrise, and is densest at or after midnight. It arises in calm clear evenings, after warm days, from the cooling of moist air on damp ground, marshes, lakes, rivers, or from the cooling of moist air mixed with smoke enveloping great cities. From a height, it is seen spreading around like a sea, and creeping up hillsides. After sunrise, it rises from the ground, breaks up into Cu., and vanishes with the increasing heat, to be followed by a serene day; but it may quietly accumulate in layers, and become a Ni. It does not wet objects it touches, and thus differs from a variety of Ci.-st. of like external aspect.



Stratus.

*Cirro-cumulus*, or sonder-cloud, consists of Ci. sinking in the air, and compressed into dense roundish-white cloudlets, or woolly irregular tufts, generally at great heights. It often forms a beautiful sky in beds like flocks of sheep at rest. It is often seen through breaks in lower C. moving differently. It may vanish or pass into Ci. or Ci.-st. Solar and lunar coronæ appear in it. It occurs in warm dry weather, and between summer showers, and presages increased heat. Ci.-cu. very dense, round, and close, and with Cu.-st., presages a storm or thunder. In winter, it precedes a thaw and warm wet weather.

*Cirro-stratus*, or vane-cloud, consists of long, thin, horizontal clouds, with bent, or undulated edges. It often resembles shoals of fish, or has a barred appearance—the mackerel-backed sky. It alone, or with Ci.-cu., forebodes rain, snow, and storm. Waved Ci.-st. generally attends heat and thunder; it often forms an extended shallow bed or thin veil, through which the sun and moon shine faintly. This variety oftenest presents the finest solar and lunar halos, parhelias and paraselenes, and it is the surest prognostic of rain and snow.

*Cumulo-stratus*, or twain-cloud, is a Ci.-st. mixed with Cu. heaps, or a wide flat base surmounted by a bulky Cu., with fleecy protuberances or rocky and mountain masses. It resembles a thick-stemmed fungus, with a flat, anvil-shaped, or cirrose top. It is much denser than Cu., though the air is not dry enough to round off sharply its tops. It often forms vast banks of cloud, with overhanging masses. It is common towards night in dry windy weather, when it has a leaden hue. It generally arises from Cu. becoming denser, wider, and protruding in large irregular projections over the base. It tends to overspread the sky, and partly or wholly to become Ni., and fall in showers. Cu.-st. is intermediate between clouds indicating fair, and those indicating rough, rainy weather, and attends sudden atmospheric changes. Distinct Cu.-st. forms before thunder. Cu.-st. increases the grandeur of mountain scenery, and drops on and envelops mountain-tops like a curtain.

*Nimbus*, or Cumulo-cirro-stratus the black rain-cloud, is a cloud or mixed system of clouds, ending in showers of rain, snow, or hail. It is a dense, continuous, horizontal black or gray sheet, with fringed edges, a cap of Ci., and Cu. on the sides and below. Before rain, vast towering masses of Cu. often pass into Cu.-st., which, increasing in density, darkness, irregularity, and extent, become Ni. capped by Ci.-st. Thunder-storms are always accompanied by Ni. in its most perfect form.

The term *scud* has been applied to loose vapoury fragments of C. driven by wind, and *cumulonus* to shaggy cumuli.

The formation and height of C. vary with the quantity of vapour in the air, the course and height of air-currents, the climate, season, temperature, disposition, and extent of sea and land, and the height of land. Cloud-strata on the Pyrenees vary in average thickness from 1600 to 3400 feet. The lower surfaces of considerable masses of clouds in all climates are probably 2500 to 3000 feet above the earth. Remarkable cloud-rings prevail over the calm zones of the equator, and over those of Cancer and Capricorn. Clouds, viewed from above in bright sunshine by the aëronaut or mountaineer, appear as dense volumes of steam or masses of white cotton. Kaemtz regards the usual height of Ci. as 10,000 to 24,000 feet; Cu., 3000 to 10,000; Ni., 1500 to 5000; but Ci. may descend to 2000 or 3000 feet, and Ni. to within a few hundred feet of the earth.

C. moderate the sun's rays during day, and the earth's radiation during night. They always exhibit positive or negative electricity, but of greatest tension in thunder-storms. They are the sources of the moisture required by plants; of the water of springs, lakes, and rivers; and of the polar, glacial, and winter snows, which cover temporarily or permanently parts of the earth.

In Britain, six or seven tenths of the sky is on an average daily obscured by clouds. There is most cloud in winter, and about mid-day, and least in May or June, and during night. Summer and autumn nights are freest of clouds. All the forms of C. may be seen in one day, often very much commingled.

CLOUDY BAY. See New Zealand.

**CLOUTED** or **CLOTTED CREAM** is obtained by heating milk in a shallow wide pan on a hot plate or over a slow charcoal-fire. The milk must be strained, as soon as it comes from the cow, into the pan, where it must stand for 24 hours before heating. It usually takes from half an hour to three-quarters of an hour to heat the milk completely; but it must not boil. It then stands for 24 hours, when the cream is skimmed off, and a little sugar thrown on the top. The result is C. C., which, mixed with new milk, is eaten with strawberries, raspberries, tarts, &c. Devonshire is famous for its clouted cream.

**CLOVE BARK**, another name for CULILAWAN BARK (q. v.).—Another bark which occurs in commerce under the name of C. B. is that of the *Myrtus caryophyllata*, a native of Ceylon and the Mascarene Isles. It is in sticks two feet long, formed of several pieces of very thin and hard bark, rolled up one over the other, of a deep brown colour, and of a taste similar to that of cloves. It possesses properties analogous to those of cinnamon.

**CLO'VER**, or **TR'EFOIL** (*Trifolium*), a genus of plants of the natural order *Leguminosæ*, sub-order *Papilionaceæ*, containing a great number of species, natives chiefly of temperate climates, abounding most of all in Europe, and some of them very important in agriculture as affording pasturage and fodder for cattle. The name C. is indeed popularly extended to many plants not included in this genus, but belonging to the same natural order, and agreeing with it in having the leaves formed of three leaflets, particularly to those of them which are cultivated for the same purposes, and sometimes collectively receive from farmers the very incorrect designation of *artificial grasses*, in contradistinction to *natural grasses*, i. e., true grasses. See MEDICK and MELILOT. The true clovers (*Trifolium*) have herbaceous, not twining stems; roundish heads or oblong spikes of small flowers; the corolla remaining in a withered state till the ripening of the seed; the pod enclosed in the calyx; and containing one or two, rarely three or four seeds. About 17 species belong to the flora of Britain.—The most important of all to the British farmer is the COMMON RED C. (*T. pratense*), a native of Britain and of most parts of Europe, growing in meadows and pastures. It is a perennial, but is generally treated as if it were a biennial. Its heads of flowers are oval or nearly globular, very compact, about an inch in diameter, purple, more rarely flesh-coloured or white; the tube of the calyx is downy; the stipules run suddenly into a bristly point. The leaflets have very often a whitish horseshoe mark in the centre. This plant was formerly reputed very noisome to witches; knights and peasants wore the leaf as a potent charm against their arts. It is supposed that C. found its way into England from the Netherlands about the time of Queen Elizabeth; but it was not until the close of last century that it was introduced into Scotland, where it is now universally prevalent. The ZIGZAG C. (*T. medium*), also called MEADOW C., MARL-GRASS, and COW-GRASS, much resembles the Common Red C., but is easily distinguished by the smooth tube of the calyx, and by the broader, less membranaceous, and gradually acuminated stipules. The stems are also remarkably zigzag, and more rigid than in *T. pratense;* the heads of flowers are larger, more lax, more nearly globose, and of a deeper purple colour; and the leaflets have no white spot. It is a common plant in Britain and most parts of Europe.—WHITE or DUTCH C. (*T. repens*) is also a common native of Britain and of most parts of Europe. When a barren heath is turned up with the spade or plough, White C. almost always appears. It is said to be a native also of North America, where, however, it is perhaps only naturalised. The flowers of all kinds of C. are the delight of bees, but those of this species perhaps particularly so.—ALSIKE C. (*T. hybridum*), a perennial, regarded as intermediate in appearance between the Common Red C. and the White C., has of late attained a very high reputation. It was introduced into Britain from the south of Sweden rather more than twenty years ago.—CRIMSON C., or ITALIAN C. (*T. incarnatum*), an annual, native of the south of Europe, with oblong or cylindrical spikes of rich crimson flowers, is much cultivated in France and Italy, and has of late been pretty extensively grown in some parts of England, producing a heavy crop.—MOLINER'S C. (*T. Molineri*) very much resembles Crimson C., but is biennial, and has pale flowers. It is cultivated in France and Switzerland.—ALEXANDRIAN C., or EGYPTIAN C. (*T. Alexandrinum*), an annual species, a native of Egypt, universally cultivated in its native country, where it is the principal fodder for cattle, has been tried in Britain, but the colder climate has been found to render it less luxuriant and productive. It is supposed to be one of the best kinds of C. for

Red Clover (*Trifolium pratense*).

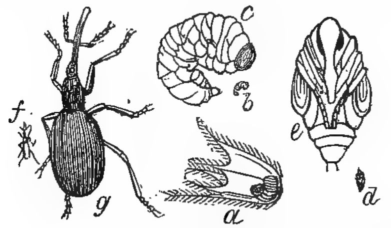
White Clover (*Trifolium repens*):
*a*, head of flowers when the pods are ripening.

many of the British colonies. It has oval heads of pale-yellow or whitish flowers.—Yellow C., or Hop Trefoil (*T. procumbens*), is very common in dry gravelly soils in Britain, but not much esteemed. It has smaller leaves and heads of flowers than any of the cultivated species. Its flowers are yellow.

It is little more than a century since clovers were introduced into field-culture in Britain. They are now universally cultivated on large farms in alternation with grain crops. The kinds most generally sown are the *Common Red*, *Cow-grass*, *Dutch White*, *Yellow*, and *Alsike*. The *Common Red* is the finest and most valuable, but it is difficult to grow unless on naturally rich soils. In America it grows well on sandy loams, though sown every alternate year on the same land. But in Britain the land is thought to become 'clover-sick' when sown too frequently with this crop. An interval of not less than eight years is thought advisable. From 6 to 20 lbs. of seed per acre is the quantity sown. Red C. is most esteemed for being mixed with rye-grass for the making of hay. When it grows well, it bears to be cut more than once in a year. *Cow-grass* much resembles the common Red Clover. It is coarser but hardier, and better suited for pasture, as it bears more herbage, and comes better up after being eaten close down by stock. *Dutch White C.* is only esteemed for pasture; it grows short and thick on the ground, but throws out fresh stems and flowers during the most of the growing season. In the south of England, it is sometimes sown with but little rye-grass seed along with it; in Scotland, as much as a bushel or a bushel and a half of rye-grass is mixed with it for pasture. *Yellow C.* is chiefly sown on ground where neither the white nor red grows freely. It is not sown so frequently as it probably ought to be, for it rises early in spring, and a mixture of it with other clovers forms good pasture on all grounds. *Alsike C.* has been recently introduced; it rises much higher than White C., and offers to be a useful addition to our pasture-plants. Land must be thoroughly cleaned of perennial weeds before it is sown with C., as the land cannot be subjected to cultivation while it is under this plant; C., therefore, is always sown in the end of the rotation, or as near the fallow or turnip crop as possible. It is sown early in spring among the winter-wheat, or with the barley crop, and slightly harrowed in; for the seeds being small are not difficult to bury. Farm-yard manure is as good as any for clovers. A well-manured soil greatly assists in keeping the plants from dying out in spring. Clovers, like grasses, play a most important part in restoring fertility to land which has been exhausted by grain-crops. Their leaves gather food—carbonic acid and ammonia—from the atmosphere, which they store up in their roots and stems; and these, on decomposing, afford food for cereals or other crops which are more dependent on a supply within the soil.

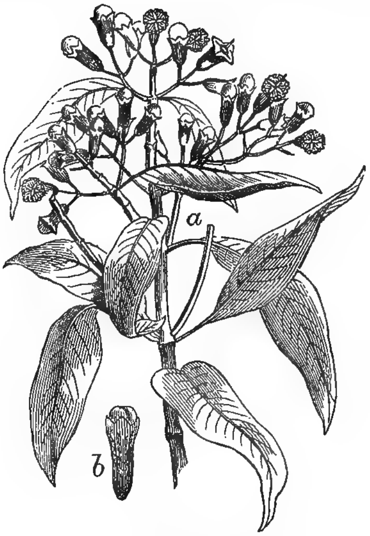
The caterpillars of a number of species of moth feed on the leaves of different kinds of C.; but the insects most injurious to C. crops are weevils of the genera *Apion* and *Sitona*. See Clover-weevil and Pea-weevil.

**CLO'VER-WEE'VIL** (*Apion*), a genus of small pear-shaped weevils (coleopterous insects, section *Tetramera*, family *Rhynchophora*), different species of which feed on the leaves, and their larvæ on the seeds of clover, some also on those of tares and other leguminous plants. Like the other weevils, the perfect insect has the head very much elongated into a sort of muzzle. *A. apricans* often does much injury to fields of common red clover, particularly interfering with the production of seed. It lays its eggs among the flowers, and the little grubs eat their way through the calyx into the pod. It is of a bluish-black colour, little more than a line long. *A. flavipes* is attached in like manner to white clover, and other species of clover have their particular weevils.



Red Clover Weevil (*A. apricans*):
*a*, maggot in calyx, slightly magnified; *b*, larva; *c*, larva, magnified; *d*, pupa; *e*, pupa, magnified; *f*, female beetle; *g*, female beetle, magnified.

**CLOVES** (Fr. *clou*, a nail) are the flower-buds of the Clove-tree (*Caryophyllus aromaticus*). The genus to which this tree belongs is of the natural order *Myrtaceæ;* the calyx has a cylindrical tube and 4-cleft border; the corolla consists of four petals united by their tips; the stamens are in four clusters; and the fruit is an oblong dry berry with one or two cells and as many seeds. The clove-tree is from 15 to 40 feet high, with a beautiful pyramidal head. The leaves are large, ovate-oblong, acuminated at each end, evergreen: the flowers are small, but produced in great profusion in cymes. Leaves, flowers, and bark have an aromatic odour. The ripe fruit in shape resembles an olive, but is not quite so large; it is of a dark-red colour; it sometimes appears in commerce in a dried state, under the curious name of *Mother Cloves;* it has an odour and flavour similar to C., but much weaker: the broken fruit-stalks are sometimes also used for the same purposes as C.; but the flower-buds themselves are the principal product of the tree. They are gathered, and are dried by exposure to the smoke of wood fires, and afterwards to the rays of the sun, or by the latter



Cloves:
*a*, a branch with leaves, buds, and flowers; *b*, a bud.

alone. When first gathered, they are reddish, but become of a deep-brown colour. The unexpanded corolla forms a little round head at the end of the calyx tube, which is about half an inch long, and thus the appearance is not unlike that of a little nail, whence the name. The clove-tree is a native of the Moluccas, and the Amboyna C. are still esteemed the best; but the tree is now cultivated in Sumatra, Bourbon, Mauritius, and some parts of the West Indies, and will probably soon be common in many other tropical countries. The Dutch, in order to secure to their own colonists a monopoly of the trade in this spice, destroyed the trees in the other Molucca Islands, and confined the cultivation of them to the isle of Ternate. It is not deemed quite certain that C. are the *karyophyllon* of the ancient Greeks; but before the discovery of the Spice Islands, eastern merchants brought them from Arabia, Persia, and Egypt, to the harbours of the Mediterranean, from which the Venetians and Genoese diffused them over Europe.

The Wild Clove-tree of the West Indies is *Myrcia acris*. See MYRCIA.

The properties of C. depend chiefly on an essential oil, *Oil of C.*, which forms one-fifth or one-sixth of their whole weight. They are used for flavouring dessert dishes and articles of confectionary. They have a hot taste and a characteristic odour. The oil of C. is obtained by repeatedly distilling C. with water, when two oils pass over, one of which is lighter, and the other is heavier than water. The oil has a hot acrid taste, is of a light yellow when pure, and brown red when not so carefully prepared. It has a well-known odour, and is soluble in ether, alcohol, and the fixed oils. It is useful in medicine to check nausea and griping, caused by the administration of purgatives. It is also employed in the scenting of soap, and by the distiller. *Tincture of C.* is obtained by treating C. with alcohol for several days, and then straining, or by a solution of the oil of C. in spirits of wine. It is added, in medicine, to stomachic, tonic, and purgative mixtures.

**CLOVIS** (old Ger. *Chlodwig*, i. e., 'famous warrior;' modern Ger. *Ludwig*, Fr. *Louis*), king of the Franks, was born 465 A.D., and by the death of his father, Childeric, became king of the Salian Franks, whose capital was Tournay. His first achievement was the overthrow of the Gallo-Romans under Syagrius, near Soissons. He then took possession of the whole country between the Somme and the Loire, and established himself in Soissons. In 493, he married Clotilda, daughter of a Burgundian prince. His wife was a Christian, and earnestly desired the conversion of her husband, who, like most of the Franks, was still a heathen. In a great battle with the Alemanni, at Tolbiac, near Cologne, C. was hard pressed, and as a last resource, invoked the God of Clotilda, offering to become a Christian, on condition of obtaining the victory. The Alemanni were routed, and on Christmas Day of the same year, C. and several thousands of his army were christened by Remigius, Bishop of Rheims. Most of the Western Christian princes were Arians, but C. was strictly orthodox, and, in consequence, was saluted by Pope Anastasius as the 'Most Christian King.' In 507, love of conquest concurring with zeal for the orthodox faith, C. marched to the south-west of Gaul against the heretic Visigoth, Alaric II., whom he defeated and slew at Vouglé, near Poitiers, taking possession of the whole country as far as Bordeaux and Toulouse; but was checked at Arles, in 507, by Theodoric, king of the Ostrogoths. C. now took up his residence in Paris, where he died in 511. His great aim was the subjugation of all the Frankish princes, and the union of the whole Frankish people into a single powerful kingdom. The means he employed to secure this end were cruel and unscrupulous, but the end itself would have been very beneficial, if he had not frustrated it at his death by re-dividing the newly organised realm among his four sons, and exposing it to the very perils from which he himself had rescued it.

**CLOYNE**, an ancient episcopal town, in the south-east of Cork county, 15 miles east-by-south of Cork. The bishopric was founded in the 6th c. by St Colman, the abbey in 707, and the cathedral in the 13th century. Near the cathedral is a round tower, 92 feet high. About 1430, the episcopate was united to that of Cork, separated in 1678, and reunited in 1835. There are valuable marble quarries near. Berkeley, the celebrated philosopher, was born here, and was Bishop of C. in 1678. Brinkley, the astronomer, who died in 1835, was also Bishop of Cloyne. Pop. 1713.

**CLUB.** The word is probably allied to *cleave* (Ger. *kleben*), 'to adhere,' so as to form one body or mass. Among other significations, it is used to mean a company or association met for some common purpose, whether of hilarity, literature, politics, or economy. C., in its usual English acceptation, means a body of persons meeting for social or recreative purposes, and consisting of members belonging for the most part to some one class or occupation. Occasionally, other meanings are given to the word. Societies for political objects are sometimes called clubs; and *Benefit Clubs* are another name for *Benefit Societies*. What is known as club-life, as exhibited in London, had its origin in the days of Elizabeth, when the Mermaid Tavern, in Fleet Street, enlivened by the wit and wisdom of Shakspeare, Raleigh, Ben Jonson, Beaumont, and Fletcher, became the home of a sort of club. Ben Jonson afterwards founded a second C. at the Devil Tavern, in the same street. Such clubs were meetings for social recreation, to which all were welcome who could bring wit and humour with them. In subsequent reigns, meetings of a similar racy character were very frequently held in taverns, but without much club formality. In last century, Brooks's and White's clubs, and a few others named after the proprietors of the houses in which the meetings were held, were established by politicians of opposite parties, as the head-quarters for parliamentary tactics.

The modern clubs of London, in which the *restaurant* or dining-room is an important feature, arose after the termination of the great war in 1815. Many naval and military officers, being no longer needed for war, were placed upon half-pay; and this half-pay was insufficient to support them without careful economy. If they could dine together at a C., it would be cheaper than if each maintained a separate establishment. Hence originated the United Service C.; and the success of this speedily led to the founding of others for different classes of society, and for persons of different political opinions. At the present time, there are about 50 such clubs in the metropolis, of which the following may be ranked as the principal: Army and Navy, Arthur's, Athenæum, Boodle's, Brooks's, Carlton, Conservative, Guards', Junior United Service, Oriental, Oxford and Cambridge, Parthenon, Reform, Travellers', Union, United Service, United University, White's, and Windham's. All these, and some of the others, combine the *tavern* system with the *club* system. Edinburgh has three clubs—the New, the United Service, and the Northern;

Glasgow has one, the Western; and there is also one such establishment at Aberdeen.

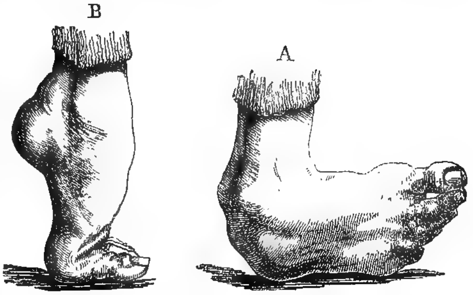
Each principal C. comprises a certain definite number of members; it may be, for instance, 500, 1000, or 1500, and this number cannot be exceeded without a formal change in the rules. In some clubs, the managing committee are empowered to admit distinguished persons to membership; but the general mode of admission is by ballot, each member having a vote. In some clubs, one single black ball or 'No' suffices to exclude a candidate; but, generally, the rules are not so stringent. The members pay a sum of money on entrance, and then an annual subscription—the amounts varying much in different clubs. The entrance-money may be required as capital, to assist in building the club-house, &c.; while the annual subscriptions, after paying current expenses, leave a surplus for future contingencies. The more important clubs comprise morning or news rooms, libraries, coffee-rooms, dining-rooms, drawing-rooms, and a very complete culinary establishment. There are no arrangements for the members to sleep at the club-houses; except at certain establishments called club-chambers, which, however, are not properly clubs. Some of the clubs are furnished with bath-rooms, card-rooms, billiard-rooms, and smoking-rooms. The *restaurant* department is usually very complete; everything is of the best, and is supplied to the members as nearly as can be at prime cost. In nearly all the clubs, hard-drinking is discouraged. It has been ascertained at two or three of them, that the average cost of dinners is about half-a-crown, and that the wine scarcely exceeds half a pint to each diner.

It may here briefly be mentioned, that some of the club-houses rank among the most elegant modern buildings in London. The Carlton, the Reform, the Conservative, and the Army and Navy club-houses are especially to be named in this respect.

Before the first Revolution, it was attempted to get up political clubs in Paris on the English plan, but they were prohibited by the police. With the meeting of the National Assembly, and the outbreak of the Revolution, political societies, about 1789, sprang into unwonted activity. These associations mostly assumed the English name—such as the Club des Feuillans and the Jacobin Club; but they had quite a different character: they were popular societies. In them were concentrated the great political parties of the nation, by means of systematic organisation and affiliation. The Jacobin Club thus came in the end to embrace all France, and to rule it. Similar associations sprang up in Germany, Italy, Spain, and wherever the Revolution took any root. In Germany, these unions were prohibited in 1793 by a law of the empire; and the prohibition of all political unions and meetings was renewed in 1832 by an act of the Germanic Confederation. The suppression of the clubs in France followed the extinction of the Revolution, and their place has since been taken by secret societies. After the revolution of 1848, clubs revived in great force in Italy and Germany, after the style of the first French Revolution, but speedily came to an end along with that which had given them birth.

**CLUBBING**, in cabbages, turnips, and other plants of the genus *Brassica*, a diseased growth of tubercular excrescences in the upper part of the root or lower part of the stem, caused by the larvæ of the Cabbage Fly (q. v.), and of other insects, by which the vigorous growth of the plant is prevented, and crops are often much injured. It is common for gardeners to cut away these excrescences, with their contained larvæ, in planting out young cabbages, &c.; and where they are not so numerous that the injury done by the knife is necessarily great, this plan succeeds very well. Dressings of quick-lime, wood-ashes, &c., have been recommended, and appear to have proved partially successful in preventing this evil, probably by deterring the parent insect from approaching to lay her eggs; but change of crop, when practicable, is of all things the most commendable. C. is sometimes confounded with Anbury (q. v.), from which it is quite distinct.

**CLU'B-FOOT** (Lat. *talipes*) is a distortion or twisting of the foot by one or more of its muscles being permanently shortened. It may exist from birth, or occur in early childhood after convulsive fits. Surgeons recognise four varieties of C.: turning inwards (*varus*), outwards (*valgus*), downwards with elevation of the heel (*equinus*), or upwards with depression of the heel (*calcaneus*).



Club-feet:
A, Talipes Varus; B, Talipes Equinus.

As age advances, the bones alter in form from the pressure exerted upon them, the ligaments shorten, and the foot becomes rigidly moulded in its unnatural position. It cripples the person's movements, and in many instances has proved a great affliction. Lord Byron's whole life seems to have been embittered by one of his feet being inverted.

Although Lorenz, in 1784, cut the tendo Achillis to lower the heel in talipes equinus, yet, owing chiefly to the dangers of cutting across tendons, C. was practically incurable till 1831, when Dr Little of London, having himself a C., after seeking relief from many surgeons at home and abroad, found his way to Dr Stromeyer, at Erlangen. This ingenious surgeon introduced a narrow-bladed knife, and divided the tendons of the contracted muscles with such a small external wound that scarcely any inflammation resulted. Dr Little being cured, published a treatise on the subject, and at the present day no deformity of the foot is considered irremediable. However, it must be remembered that the division of tendons must be followed by judicious manipulations, and generally by the application of some suitable apparatus to prevent the foot returning to its former position. Of such apparatus, Scarpa's Shoe, as it is termed, may be mentioned as the one most frequently in use. See Orthopædic Surgery.

**CLU'B-MOSS.** See Lycopodiaceæ.

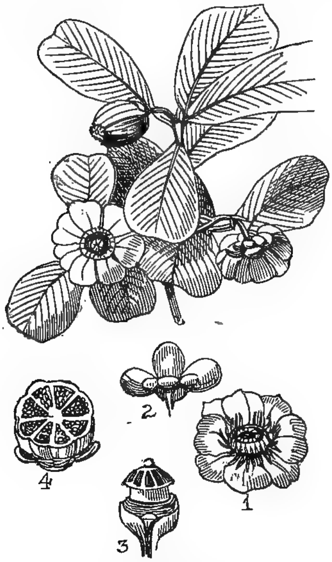
**CLU'B-RUSH.** See Scirpus.

**CLUNCH**, a name given locally by miners to any tough indurated clay, such as is sometimes found in the coal-measures, or in the newer strata. The term has also been applied to the lower and harder beds of the cretaceous rocks, which are sometimes used for the stone-work of the interior of ecclesiastical buildings.

**CLUPE'IDÆ**, an important family of Malacopterous (q. v.) fishes, nearly allied to the *Salmonidæ*, and differing from them chiefly in the want of an adipose fin. They are all scaly fishes, but the scales are very easily detached. None of the fins have any spinous rays. The ventral fins are nearly in the middle of the body. The dorsal fin is always solitary. The gill-openings are very large. The teeth are small, and generally numerous. The maxillary bones are composed of three pieces easily separated. The body is generally elongated, and much compressed; the belly thin, and almost reduced to a sharp edge, frequently denticulated by the edges or points of a series of small bones attached to the skin. The air-bladder is always large; the roe consists of a vast number of eggs. The fishes of this family are almost exclusively marine, only a few of them ascending rivers. They generally congregate in shoals, and some of them periodically visit certain coasts in vast multitudes. They are very widely diffused over the world; some of the particular species have a wide geographic range. To this family belong the Herring, Pilchard, Sprat (Garvie, Kilkie), Anchovy, Sardine, White-bait, &c. See these articles. The Herring may be regarded as the type of the order, and of the genus *Clupea*. But the genera most important in an economical point of view have been very differently distinguished by different ichthyologists.

**CLUPESO'CIDÆ**, a family of Malacopterous fishes, so named from being regarded as exhibiting characters intermediate between those of the *Clupeidæ* (Herring, &c.) and of the *Esocidæ* (Pike, &c.). Some of them are marine, and some are fresh-water fishes. They are mostly tropical; none are British. To this family belongs the interesting genus *Arapaima* (q. v.), and the genera *Heterotis* and *Butirinus*, containing fishes of very curious structure and appearance, highly prized for the table.

**CLU'SIA** (named in honour of the great botanist L'Ecluse or Clusius), a genus of tropical trees and shrubs of the natural order *Guttiferæ* (q. v.) or *Clusiaceæ*, some of which are commonly called Balsam trees, from their resinous or balsamic products. They are very often *epiphytes*, growing on larger trees, over the bark of which their roots spread in search of chinks or decayed parts where they may obtain nourishment; and if it cannot be obtained in sufficient quantity, a root is sometimes sent straight down to the ground, and in due time becomes a kind of stem. The fruit is very curious, a subglobular capsule, with a number of cells, opening as by meridian lines from top to base. *C. rosea*, a native of the West Indies and tropical parts of America, yields an abundant resin, which is used as an external application in veterinary medicine, and for covering boats instead of pitch. A great quantity of resin exudes from the disk of the flowers of *C. insignis*, the WAX-FLOWER of Demerara, which is used to make a gently stimulating and soothing plaster. This is one of the productions of Demerara, to which the colonists, in preparations for the next 'Great Exhibition' (of 1862), are seeking to draw general attention.



Clusia Rosea:

1, an expanded flower; 2, a calyx seen from below; 3, the ovary, with a part of the calyx cut away; 4, a transverse section of a fruit.

**CLUSO'NÉ**, a town of Lombardy, Northern Italy, situated near the left bank of the Serio, 17 miles north-east of Bergamo. It has manufactures of linen, a trade in corn and iron, and in the neighbourhood are vitriol works and copper foundries. Pop. 5500.

**CLU'STERED CO'LUMNS**, or, as they are sometimes called, Compound Piers, form one of the richest features in Gothic ecclesiastical architecture. The columns or shafts are sometimes attached to each other throughout their whole length, sometimes only at the base and capital. When surrounded by floriated fillets, they have been very aptly compared by Sir Walter Scott to 'bundles of lances that garlands have bound.'

**CLWYD**, a river of North Wales, rises in the Bronbanog Hills, in the south-west of Denbighshire, and runs 30 miles, first south, then east-north-east, and lastly north, through Denbigh and Flint shires, past Ruthin, St Asaph, and Rhuddlan, into the Irish Sea. Below Ruthin, and between barren hills, lies the fertile, populous, and level vale of the C., 15 by 5 to 7 miles. At St Asaph, the C. receives the Elwy, 20 miles long, from the west, and increases much in size. It then enters the fertile and extensive marsh of Rhuddlan, and falls into the sea by a small estuary. It is navigable for vessels of 70 tons up to Rhuddlan, a distance of two miles from its mouth.

**CLYDE**, a river in the south of Scotland, the only great British river, besides the Severn, flowing west. Commercially it is the most important river in Scotland, and the romantic beauty of its scenery is widely celebrated. It rises by several large streams in the semicircular range of the Lead, Lowther, and Moffat Hills, and drains the shires of Lanark, Renfrew, and Dumbarton. The main and southmost source, the Daer, runs north, and receives the Powtrail Clyde (a smaller stream, after junction with which, the main stream is called the C.), and other streams, preserving its mountain character to Roberton, upwards of 20 miles below the source of the Daer. The C. then bends round Tinto Hill towards Biggar,* from whence it flows north-west, west, and south-west, to about 4 miles above Lanark, thence pursuing a north-west course through Lanarkshire, and between Dumbarton and Renfrew shires, past Lanark, Hamilton, Glasgow, Renfrew, and Dumbarton, near which town it opens into the Firth of Clyde. In this course, it receives a number of streams, and flows through a rich, fertile, wooded valley, often extending into level plains, and often with bold wooded banks. From

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* In very high floods, the waters of the Clyde sometimes overflow in the boggy ground there, and a portion runs into the Biggar Water, and so into the Tweed.

2 miles above to 4 miles below Lanark occur the celebrated Falls of the C., a series of cascades and rapids, the largest in Scotland for quantity of water—the total descent, in the course of six miles, being 230 feet over old red sandstone rocks, amid very picturesque scenery. Two of the Falls are above, and two below Lanark. Bonniton Linn, two miles above Lanark, is a cascade of 30 feet, with some parts only 4 feet broad. Corra Linn, half a mile below the last, is the grandest fall, forming three distinct leaps—in all, 84 feet high. Dundaf Fall is 10 feet high. Stonebyres Linn, two miles below Corra Linn, forms three distinct falls—in all 70 feet. Below Glasgow, the C. expands into an estuary, navigable by the largest vessels, and at Greenock it attains a breadth of about 4 miles. Opposite this point it communicates with the Gareloch, and a little below, with Loch Long on the north. Its course, which from Glasgow has been west-north-west, now turns suddenly south, in which direction, inclining a little to the west, it continues to flow between Argyle and Bute, and Cantire on the west, and Renfrew and Ayr shires on the east, until it becomes identified with the North Channel at Ailsa Craig, where its breadth is about 30 miles. The C. from its source to Glasgow is, by its windings, 75 miles long, and from Glasgow to the south end of Cantire, 48 miles. Its basin occupies 1500 square miles, and consists of carboniferous strata and trap rocks, the latter chiefly forming the bordering mountains. Floods sometimes raise its waters 20 feet, and it has changed its course at Renfrew, which was once close to it. Clydesdale, or the valley of the C., is noted for its coal and iron mines, orchards, and horses. Bell, in 1812, launched on the C. the first boat in Europe successfully propelled by steam.

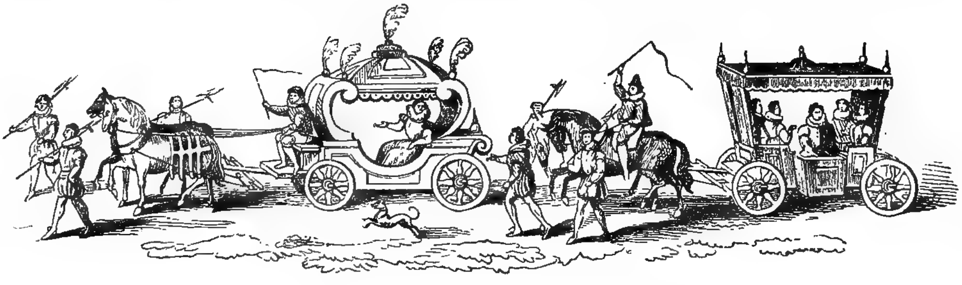
**CLYDE**, LORD. See CAMPBELL, SIR COLIN.

**CLY'STER** (Gr., from *klyzo*, I wash out), called also *enema*, a medicine administered in the liquid form by the rectum, or lower end of the intestine. It is used either for the purpose of procuring evacuation of the bowels, or of conveying stimulating or nourishing substances into the system. For the latter purpose, wine and beef-tea, or milk, in quantities of a few ounces at a time, are employed; for the former, simple warm or cold water in sufficiently large quantity to distend the bowels, and produce evacuation; or in special cases, various cathartics may be used in addition, such as colocynths, aloes, castor oil, or turpentine made into an emulsion with yolk of egg, and sometimes carminatives, to expel air. Narcotic clysters are also employed, but should only be used under medical superintendence. An injecting syringe, with a flexible tube, and a double-action valve, is usually employed for the administration of this remedy.

**CLYTEMNE'STRA**, in Homeric legend, the daughter of King Tyndareus and of Leda, and the twin-sister of Helena, became the wife of Agamemnon, and bore him a son, Orestes, and two daughters, Iphigenia and Electra. During the absence of Agamemnon on his expedition to Troy, she formed a connection with Ægisthus, murdered her husband on his return, and reigned for seven years with Ægisthus, till she was murdered by her own son, Orestes.

**CNI'DUS**, or **GNIDOS**, a city on the promontory of Triopion (now Cape Krio), in Caria, in Asia Minor, a Lacedæmonian colony, and one of the six cities of the Doric league. C. (according to Strabo) had two ports, one of which could be closed. In front of what was the town, lies a lofty island, about 600 yards long, which was connected with the mainland by a causeway (now a sandy isthmus). The southern port was formed by two moles, carried into the sea to the depth of nearly 100 feet, one of which is nearly perfect at the present day. The city was famous for several temples of Venus, who was therefore sometimes called the Cnidian goddess. One of these temples contained the famous statue of the naked Venus by Praxiteles. It was of Parian marble, and so beautiful, that Nicomedes, king of Bithynia, offered, in return for this master-piece of Grecian sculpture, to pay the entire debt of the city, which was very large. The Cnidians, in the excess of their devotion to art, refused. During the wars in ancient times, C. was often mercilessly plundered. The site of the city is 'covered with ruins.'

**COACH** is a general name for a vehicle drawn by horses, designed for the conveyance of passengers, as distinguished from a wagon or cart, for the conveyance of goods. Coaches or enclosed carriages, drawn on wheels, and intended for passengers, were inventions which have been claimed by Hungary, England, Italy, France, Spain, and Germany. The name is derived by Wedgwood from Fr. *coucher*, to lie, which becomes in Dutch *koetsen*, whence *koetse* or *koets-wagen*, a litter or carriage in which you may recline. The earliest record found by Beckmann relates to about the year 1280, when Charles of Anjou entered Naples, and his queen rode in a *caretta*—apparently a small but highly decorated car, from which the modern *charet* or *chariot* was derived, as well as other vehicles named *chares* and *chariettes*. It is believed that most of these vehicles had broad wheels, the only form suited for the wretched roads of those ages; and it is certain that all those of early date were open overhead. Many of the coaches used by the continental princes and nobles in the 16th c. were



State Carriage of Queen Elizabeth:
From Hoefnagel's print of Nonsuch Palace.

closed only to this extent—that they had canopies supported by ornamental pillars, and curtains of cloth, silk, or leather, which could be drawn easily aside. A *glass* C., or C. with glass windows, is specially mentioned as being used by an Infanta of Spain in 1631. The traces of the coaches were at first made of rope; those only belonging to the highest personages were made of leather. It is believed to have been in the time of Louis XIV. that coaches were first suspended by leathern straps, in order to insure ease of motion.

The first C. ever seen in England is said to have been one made in 1555 by Walter Rippon for the Earl of Rutland; and in 1564, the same builder made a showy vehicle for Queen Elizabeth. Later in the reign, the royal carriages had sliding panels, so that the queen could shew herself to her loving subjects whenever she desired. During the closing years of Elizabeth's reign, and early in the 17th c., the use of pleasure-carriages extended rapidly in England. The coaches had first to struggle against the opposition of the boatmen on the rivers, and then against that of the sedan owners and bearers; but they gradually came into very general use. The successive steps whereby the coaches of those days gave way to the elegant vehicles of the present, need not be traced in detail, even if there were the means to do so.

The following are some of the chief kinds of pleasure-carriages. The *Dennet* is a two-wheeled vehicle for one horse, with a jointed hood or head covered with leather, and a driving-box. The *Stanhope* bears some resemblance to the dennet. The *Tilbury* is in like manner a two-wheeled vehicle for one horse; but it has pliable leathern braces between the springs and the body of the vehicle, together with suspension brackets. The *Cabriolet* belongs to the same class as the tilbury. The name *Cab* is an abbreviation of cabriolet, but it has come to be applied to a four-wheeled vehicle. The *Curricle* is a two-wheeled vehicle for two horses; there are no shafts; but a pole, fixed to a frame which supports the body, passes between the horses, and is suspended from a metal bar resting on their backs. The *Phaeton* is a four-wheeled vehicle which may be drawn either by one or two horses; its front body is something like that of a dennet or stanhope, and behind this is an open seat, supported on a kind of large box. The *Coach* is a closed four-wheeled vehicle for two or more horses, with two seats inside, and a skilfully constructed arrangement of springs to insure ease of motion. The *Chariot*, or chaise of modern days, usually differs from the C. in having only one seat. The *Landau* is a C. made to open occasionally. The *Barouche* is permanently open, with only a leathern hood or head over it. The *Britzschka* is a kind of small barouche. In addition to these, our age has witnessed the manufacture of the *Brougham*, a miniature coach usually for two persons, but in which four may be accommodated; and the *Clarence*, a pair-horse carriage with movable glazed panels and hood, and for two or more persons.

The manufacture of carriages, whether pleasure-vehicles or omnibuses, ranks in the highest class of mechanical labour. There is a necessity for the best materials and the best workmanship: since, owing to the severe strains and jerks to which the vehicles are subject, cheap construction is in the end unprofitable. Many different kinds of wood are employed in the construction. The body of the C. is made by one set of workmen, the under-framing by another; the former partaking more than the latter of the nature of cabinet-work. The steel-spring making is delicate work, owing to the necessity for combining strength with lightness and elasticity; and the various pieces of iron-work require careful adjustment, especially the axles. The covering of the upper part of the body of a C. with leather is one of the most difficult parts of the manufacture; one single hide is employed, the leather being worked round the corners by repeated currying while wet; and all must be rendered smooth, without even a puncture. The best coaches receive as many as 20 to 30 coats of oil-paint; and the polishing processes are numerous and carefully conducted. The carving, gilding, herald-painting, lace and fringe work, metal ornamentation, &c.—all are among the best examples of their respective handicrafts.

English carriages are considered to be the best in the world; none else combine so much strength with an equal degree of beauty. The artisans employed in this trade, especially coach-body makers and coach-spring makers, command a very high rate of wages.

**COADJU'TOR** (Lat.), a fellow-worker not as principal but as second, an assistant. Technically, it is applied in ecclesiastical law to one appointed to assist a bishop, whom age or infirmity has disabled. By 52 Geo. III. c. 62, coadjutors to bishops and archbishops in Ireland are empowered to exercise all the powers of their principals except that of presenting to benefices. See EXECUTOR.

**COAGULA'TION**, the amorphous (q. v.) solidification of a liquid, or part of a liquid, as when the caseine of milk is solidified by rennet in making Cheese (q. v.), or the white of an egg by boiling. The process varies in various substances. Albumen, or the white of an egg, coagulates at a temperature of 160°. Milk is coagulated or curdled by the action of rennet or by acids. The fibrin in the blood, chyle, and lymph of animals is coagulated by the separation of these fluids from the living body. See BLOOD.

**CÖAHUI'LA**, a state of the Mexican Confederation, is separated from Texas, in the United States, by the Rio Bravo del Norte, in lat. 24°—30° N., and long. 100°—103° E. It contains 30,740 square miles, and about 80,000 inhabitants. Besides a capital of its own name, with a population of about 4000, it has the towns of Saltillo and Santa Rosa. It possesses some silver-mines; but it is valuable chiefly for its pasturage.

**CÖA'ITA.** See ATELES.

**COAL**, in the sense of a piece of glowing fuel (and hence a piece of fuel, whether dead or alive), is a word common to all the languages of the Gothic stock (Icel. *kol*, Ger. *kohle*), and seems allied to the Lat. *caleo*, to be hot; as also to *glow*, and *kiln*. The different sorts of fuel are distinguished by prefixes, as *char*coal, *pit*-coal, *sea*-coal; but in England, owing to the absorbing importance of mineral or pit-coal, the word C. alone has come to be used in this special signification (Ger. *steinkohlen*, Fr. *charbon de terre*).

C. is one of the most important of all minerals; it consists chiefly of carbon, and is universally regarded as of vegetable origin. Its geological relations are noticed in the article CARBONIFEROUS SYSTEM. It generally occurs in strata or beds; it is always of a black or blackish-brown colour; some of the varieties have a very considerable degree of vitreous or resinous lustre, and some are very destitute of lustre; some have a shell-like fracture, and some have a sort of slaty structure, and are readily broken into cubical or rhomboidal fragments. The precise characters of C. as a mineral species are not easily defined, and both in Britain and other countries important cases have occupied courts of law, in which this difficulty was strongly felt, as in the great Scottish lawsuit concerning the *Torbanehill Mineral* (q. v.). The name C. is indeed variously used even by mineralogists, sometimes in so wide a sense, that Anthracite (q. v.) (*Blind C.* or *Glance C.*, *Culm*) and Brown C. (q. v.), with Jet (q. v.) and all the other forms of Lignite (q. v.), are included in it; and sometimes in a sense much more restricted, in which *Slate C.* (*Caking C.*, *Cherry C.* or *Soft C.*, *Splint C.* or *Hard C.*) and *Cannel C.* are its principal varieties. *Cannel C.*, also called *Compact C.*, and, in Scotland, *Parrot C.*, is so compact and solid, that it takes a good polish, and is made into vases, boxes, ink-stands, and other articles, like jet; but its chief value is for making gas, which it yields in very large quantity. It burns with a bright flame. *Slate C.* is the more common kind, but in which there are great differences, as every reader is aware, in the degrees of compactness or of frangibility, and in many other particulars important to the consumer. Popularly, the name C. is given to the mineral substances used as fuel, whether mineralogists may term them C., lignite, or anthracite. Anthracite is not bituminous; the other kinds are sometimes collectively designated *Bituminous Coal.*

The use of C. does not seem to have been known to the ancients; nor is it well known at what time it began to be used for fuel. Some say that it was used by the ancient Britons. There seems to be reason for thinking that England was the first European country in which C. was used to any considerable extent. About the end of the 13th c., it began to be employed in London, but at first only in the arts and manufactures; and the innovation was complained of as injurious to human health. In 1316, the parliament petitioned the king, Edward II., to prohibit the use of C., and a proclamation was accordingly issued against it; but owing to the high price of wood, its use soon became general in London. It was for a long time known there as *Sea-C.*, because imported by sea.

C. is of inestimable value to man, not only as a fuel for domestic use, but for the reduction of metals and for all the purposes of the arts, including the generation of steam-power, on which so much now depends. Britain is indebted for much of her greatness to the abundance of C., along with limestone and iron ore, in large districts of the island. The most extensive and important *C.-fields* or coal-producing districts of Britain are in the north of England, in the counties of Northumberland, Durham, Cumberland, York, Lancaster, Derby, Stafford, and Nottingham; in North Wales and South Wales; and in the central lowland tract of Scotland, in the basins and near the Firths of the Forth and the Clyde. Each of the provinces of Ireland has its C. district, the least important being that of Ulster. The principal C.-field of France is in the north, and Belgium is rich in coal. Germany has many C.-fields, of which the most extensive is in Bohemia and Upper Silesia, but, upon the whole, is not very largely supplied with this valuable mineral. None of the other countries of Europe possess it in great abundance, except Spain, where it has been little heeded. In the northern parts of Europe, it is very sparingly distributed. It exists largely in India, the Burman empire, and China, where it has been worked for at least as long time as in England. It exists also in Japan, and the discovery of it in Borneo has given a new facility to commerce in the farthest East. Australia has extensive coal-fields. C. is found in New Zealand. Madagascar produces it; it is found in some parts of the West Indies; and the C. of Greenland has proved important to arctic voyagers. But the greatest C.-fields in the world are those of North America, occupying great part of the river-basins of the United States, and also of New Brunswick, Nova Scotia, and Cape Breton.

From the reports on the Paris Universal Exhibition (1855), presented to the British parliament, it appears that the United Kingdom produces about 65 million tons of coal annually, of which quantity 47½ millions were raised in England, nearly 10 millions in Wales, and about 7½ millions in Scotland, Ireland only yielding about 150,000 tons. France yields between 6 and 7 million tons, Belgium 8 millions, Prussia 9⅓, Austria about 200,000 tons, and Spain, including lignite, 2,425,500 quintals—less than 250,000 tons. The produce of the United States of America is stated at 5 million tons, that of the whole world, at 96 million tons. It is calculated that the C.-fields of England and Wales would supply 60 millions of tons annually for a thousand years.

C. may be regarded as fossil wood which, during its long interment in the crust of the earth, has undergone certain chemical changes which alter in part the proportion of its ingredients. The transformation of vegetable remains into C. is proceeding on a greater or less scale in many parts of the world at the present moment. As woody-fibre is the principal constituent of plants which thus undergoes change, it will only be necessary to refer specially to it. The constituents of woody-fibre are carbon, hydrogen, and oxygen, with minute quantities of ash and nitrogen, and occasionally sulphur, and the relative proportion of the principal elements may be recognised from the formula $C_{12}H_9O_9$. The mean percentage composition of wood, as contrasted with an average specimen of C., is given in the following table:

| | Wood. | Coal. |
|---|---|---|
| Carbon, | 49·1 | 82·6 |
| Hydrogen, | 6·3 | 5·6 |
| Oxygen, | 44·6 | 11·8 |
| | 100·0 | 100·0 |

It will be observed, therefore, that, in a chemical sense, C. differs from wood in containing a much larger percentage of carbon, less hydrogen, and a very much smaller proportion of oxygen; in other words, during the process of the decay of wood, the hydrogen and oxygen tend to disappear more quickly than the carbon, and thus a corresponding excess of carbon is left in the fossil wood. The mode in which these changes occur may be explained in several ways. Thus, carbonic acid ($CO_2$) is a constant product of the decay of vegetable matter, and in many instances carburetted hydrogen ($CH_2$) is evolved, as observed even in the working of C. mines, where this gas, under the name of fire-damp, escapes into the working. The hydrogen may be also removed by uniting with oxygen, and forming water. On the decay of vegetable matter lying on the surface of the ground, and fully exposed to the action of the oxygen of the air, the final result of decomposition would be the production of only a minute amount of black mould; but where the vegetable matter has been submerged under water, and especially if covered over by sand or other rock-matter, the process of ultimate decay is retarded and modified greatly, from the scanty supply of atmospheric air, and the product is coal.

*Anthracite* (q. v.) is in general, geologically, the oldest form of coal, and is the hardest and most dense. It generally contains upwards of 90 per cent. of carbon. Anthracite burns with difficulty, except in furnaces. It evolves a very large amount of heat. Accordingly, it is used in smelting operations.

*Slate* coals are the most abundant class. Caking C., found principally in the Newcastle and Wigan C.-fields, when placed in the fire, splits up into small pieces, which quickly yield bituminous matter sufficient to agglomerate the fragments together again, and the whole becomes caked into a soft pasty mass. At this stage, the combustion is very slow, owing to the difficulty of the oxygen of the air gaining admittance to all sides of the fragments of coal, and if great heat is required, it is necessary to break up the fused mass now and again. For this reason, Caking C. does not answer well where great furnace-heat is required, while it is the most economical kind of C. for household purposes. The Coke (q. v.) which this variety of C. yields, however, is of very great value as a heating agent in the fireplaces of locomotives and other furnaces. Splint C., or *Hard* C., occurs largely in the Lanarkshire coal-fields. When struck with a hammer, it breaks up into irregular slaty splinters. It is not easily set fire to, but when thoroughly inflamed, it burns readily, and evolves much heat.

*Cherry C.*, or *Soft C.*, does not fuse or cake in the fire, and is very soft and friable, which renders it wasteful in the working. It is not at all economical in the consumption, owing to the rapidity of its combustion. It is very quickly set fire to, and evolves heat rapidly whilst it lasts. It is found abundantly in Lanarkshire, Staffordshire, and Lancashire. Cannel or Parrot C., commonly called *Gas C.*, has of late years been largely used in the manufacture of paraffine oils for burning in lamps and lubricating machinery. See PARAFFINE OIL. The following table gives the mean composition of coal derived from different localities:

| Locality. | Specific Gravity. | Carbon. | Hydrogen. | Oxygen, Nitrogen, Sulphur. | Ash. |
|---|---|---|---|---|---|
| Scotland, average of 8 samples, . | 1·259 | 78·53 | 5·61 | 11·80 | 4·03 |
| Newcastle, average of 16 samples, . | 1·256 | 82·12 | 5·31 | 8·28 | 3·77 |
| Lancashire, average of 28 samples, . | 1·273 | 77·90 | 5·32 | 12·27 | 4·88 |
| Wales, average of 36 samples, . | 1·315 | 83·78 | 4·79 | 6·56 | 4·91 |

When C. is subjected to the action of heat in open fireplaces, the oxygen of the air tends to unite with the principal constituents, carbon and hydrogen, forming with the carbon the gaseous substance carbonic acid ($CO_2$), and with the hydrogen, a portion of water-vapour or steam (HO), and the result of this chemical union is the evolution of heat. The nitrogen of the C. escapes as gaseous ammonia ($NH_3$), the sulphur as sulphurous acid ($SO_2$), whilst the ash is left in the fireplace. Heated at or below a low-red heat in close retorts or vessels, C. yields more or less oil, accompanied by tar and a little gas and water-vapour; but when placed in retorts at a full or cherry red heat, the principal product is gas, accompanied by tar and water-vapour, holding ammoniacal compounds in solution. See GAS, PARAFFINE OIL, &c.

*Coal-trade.*—The production and sale of coal, like every other important branch of industry, was long fettered with legislative regulations. At a very early period, the corporation of the city of London undertook the duty of either weighing or measuring the C. brought into the port, and by a series of statutes, commencing with 7 Ed. VI. c. 7, the mayor and aldermen of London, and the justices of the counties, were empowered to fix the price of C. to be sold by retail; and in case of refusal by the parties to sell at the prices fixed, to enter their wharves, or other places of deposit, and to cause it to be sold at the prices which they had set. In addition to the general supervision which they thus possessed, and the sums which they were empowered to exact for their trouble, the corporations of London and other towns have exacted, and still continue to exact, dues on C. for local purposes. These were first imposed in London in 1667, after the great fire, in order to enable the corporation to repair the ravages which it had committed; and they have been since continued as a fund for civic improvements, though, as Mr M'Culloch has remarked, no improvement could be equal to a reduction in the price of coal. In the reign of William III., a general tax, payable to government, was laid on all *sea-borne coal*—a tax which was in the highest degree unjust to places which were dependent for their supply on the coasting-trade, and oppressive to the whole country, inasmuch as it amounted to more than 50 per cent. on the price paid to the owner at the pit's mouth. The tax varied in amount, not only at different periods, reaching its highest point of 9*s.* 4*d.* per chaldron during the great war, but also in different parts of the country, being higher in London and the south of England, and lower in Ireland and Wales, whilst Scotland for a considerable period was altogether exempt. The tax itself, with all its inequalities, was abolished in 1830, and there is now no tax on C. except that collected for local purposes in London and a few other towns. The repeal, in 1845, of the duty on C. exported to foreign countries, was a measure of much more doubtful policy.

For the provisions of the recent statute for the regulation and inspection of mines (23 and 24 Vict. c. 151), see MINES. The circumstances in which coal-mines are regarded as a pertinent of land, and those in which they form a separate estate, will be stated under MINES and MINERALS.

*Coal-note*, a particular description of promissory-note, used in the coal-trade in the port of London (3 Geo. II. c. 26, ss. 7, 8).

**COA'L-BEDS.** See CARBONIFEROUS SYSTEM.

**COA'LBROOK DALE**, an English coal-field in the valley of the Severn, which supplies considerable quantities of coal and iron. The group of strata which includes the coal-beds is from 700 to 800 feet thick.

**COA'L-FISH** (*Merlangus carbonarius*), a fish of the same family with the Cod and Haddock (*Gadidæ*), and of the same genus with the Whiting. It is not unlike the whiting in form, and in its fins, which, however, are not proportionally so large; but is of a very different colour, the upper parts being nearly black. It attains, also, a much larger size, being often two or three feet in length. It is celebrated among fishermen for its voracity; and is commonly found in large shoals, which, when attracted by bait, will keep near a boat till great numbers are taken. It is rather a coarse fish, but is much used in the northern parts of the world, both fresh and salted, or dried. It is found in the most arctic regions, even on the shores of Spitzbergen, and both on the European and American sides of the Atlantic. It is very plentiful on the British coasts, and in Scotland is generally known as the *Sethe.* The fry are taken in great numbers by juvenile fishers stationed on rocks, and are called *podleys* on the east and west coasts of Scotland, *sillocks* and *cuddies* on some of the Scottish coasts, and *coalseys* in the north-east of England. This fish forms an important part of the food of the Orkney and Shetland islanders, and of the inhabitants of some of the Hebrides. Vast numbers of the fry are sometimes caught by means of blankets in the mouths of streams in the Hebrides. The liver of the C. abounds in oil, which is used for lamps.

**COÄLI'TION**, in Politics, is applied to the union of two parties, or, as it generally happens, portions of parties, not of the same opinion, who yet agree to sink their differences, and act in common. Pitt the elder, when he took office in

1757, coalesced with the Whig aristocracy represented by the Duke of Newcastle. The ministry always spoken of, however, as the Great C. was formed in 1782, when Fox, the leader of the Reformers, took office along with Lord North, the leader of the opposite party. When Lord Derby's ministry resigned in 1853, there was a short C. between the Whig party, under Lord John Russell, and the more moderate of the Conservative party, under Lord Aberdeen.

**COAL-TAR.** See Gas-Tar.

**CO′AL-WHIPPING**, the name given to a mode of unloading coal from vessels at anchor in the Thames. About 1,400,000 tons of coal are annually transferred from vessels in the river to barges, which convey them to the wharves. The operation is called C., and the men, *coal-whippers*—names, the origin of which does not seem to be known. The men work in gangs of nine—a *basket-man* and eight others. Some of them shovel the coal from the hold of the ship into baskets or boxes; some haul up the boxes by ropes and pulleys; and some empty the contents into the barges.

This is all the operation—a mere example of muscular labour of the coarsest kind. It would not have called for notice in this work, had not legislative interference given a factitious importance to it. Some years ago, when the number of these men was about 2000, public-house keepers got into the habit of acting as middlemen, a position which gave them the power of compelling the men to spend nearly all their earnings in drink. The trade fell into such a state, that the men were virtually slaves to the publicans. They asked for the interference of the legislature; and this was granted in 1843. An act was passed expressly for these 2000 coal-whippers. A Coal-whippers' Board was formed, comprising members named by the Board of Trade, others named by the Corporation of London, and one by the Shipowners' Society. This Board assumed the functions of a middleman or master coal-whipper; contracted for the whipping of ships of coal, and employed the men. No one but men registered on the books of the Board was allowed to work on the Thames as a coal-whipper, with the exception of the crews of the ships and the servants of the coal-owners. This exceptionally-protected trade was maintained on the same basis by other acts passed in 1846 and 1851. In 1856, however, a further renewal was refused; and a committee of the House of Lords, in 1857, while sympathising with the men, declined to recommend any further special legislation for them. The coal-owners agreed with the Board of Trade to maintain a Whipping Office, to give the men a refuge from the publicans, but without interfering with the liberty of coal-shippers to employ whom they pleased; and this plan has since been acted on. The price formerly charged was 9*d.* to 1*s.* per ton; but machinery can now do it for 4*d.*—The C. Acts will one day be referred to as curious examples of well-meant legislation, on commercial matters which are properly beyond the reach of parliament.

**COA′MINGS**, in a Ship, are small frameworks on the deck, to prevent sea and rain water from running down the hatchways, ladder-ways, and scuttles.

**CÖA′NZA**, a river of Lower Guinea, Western Africa, which, after a course of about 500 or 600 miles, enters the Atlantic south of St Paul de Loando, in lat. about 9° 10′ S. It is navigable for a considerable distance, but a bar at its mouth renders it inaccessible save to small vessels.

**COA′ST-GUARD**, an organisation formerly intended to prevent smuggling merely, but now constituted so as to serve as a defensive force also. The old coast-guardsmen were in the employment of the Customs department; they were posted along the shore at spots commanding extensive views of the beach, and were expected to be always on the look-out for smugglers. In 1856, the C. was transferred to the Admiralty, and under this arrangement, the Admiralty may, from time to time, issue orders for the augmentation of the C., not to exceed 10,000 men in all. Lands, not exceeding three acres each, may be bought by the Admiralty for C. stations. The coasts of the United Kingdom have been divided into 11 districts. Each district is under a navy captain, who has a guard-ship at some port in the district. All the revenue cruisers and defence-gunboats are attached as tenders to the ships, and are manned therefrom. The able seamen, borne on the ships' books, and employed on shore in C. service, are in three classes—chief boatmen, commissioned boatmen, and boatmen. They receive high sea-pay, besides 1*s.* 4*d.* per day in lieu of provisions, and house-rent and medical attendance free. In war-time, all of these men may be called upon to serve as regular sailors on board ship; but their families are allowed to live rent-free during this time. The C. are taught naval gunnery, gunboat exercise, and the serving of land-batteries. The guard-ships are also employed as training-ships for the navy. Besides the 11 district guard-ships, there is a head-quarters' ship. The whole of the C. comprised, in 1860, about 9000 men—viz., 4000 employed afloat, and borne on ships' books; 3400 employed on shore, and borne on ships' books; and 1600 employed on shore, and *not* borne on ships' books.

**COAST VOLUNTEERS**, or **ROYAL NAVAL COAST VOLUNTEERS**, is a corps organised for the special defence of the coasts of the United Kingdom, separate from, but in connection with the Coast-guard (q. v.). By an act of parliament passed in 1853, the Admiralty was empowered to raise a number, not exceeding 10,000, of C. V., to consist of seafaring men and others, to be entered for five years' service, and to be exercised 28 days in each year, either on shipboard or on shore; but not to be sent more than 50 leagues from the coasts of the United Kingdom, unless in cases of emergency, when the distance might be extended to 100 leagues. One year's active service entitles them to discharge in ordinary cases; but in emergencies, they may be called out a second year on receipt of higher pay. Their pay, allowance, and rank during exercise and active service is the same as able seamen's. The bounty to be paid on entering, and the arrangements for arms, clothing, and accoutrements, are left for the Admiralty to settle from time to time. An act passed in 1856 invested the command of the C. V. in the Coast-guard, the officers of which are to superintend the training and exercising.

**COASTING-TRADE**, the commerce carried on by sea between the different ports of the same country. In Great Britain, 'coastwise' is defined to mean 'from any one part of the United Kingdom to any other part thereof.' Vessels engaged in this commerce are subject to different rates and regulations from oversea traders, and the masters must keep books shewing that their cargoes come strictly within the definition of coasting-trade. Formerly, no goods or passengers were allowed to be carried from one port of the United Kingdom to another, except in British vessels; but this restriction was repealed in 1854, and the C. of Great Britain is now open to all the world. In other countries, the exclusive policy still prevails. The regulations under which the C. are conducted are contained in the

Customs' Consolidation Act, 16 and 17 Vict. c. 107; an abstract will be found in M'Culloch's *Commercial Dictionary.*

**COAT OF ARMS**, in the military trappings of the middle ages, held the place of the *paludamentum* of the ancient Roman captains. It was a coat worn by princes and great barons over their armour, and descended to the knee. It was made of cloth of gold or silver, of fur or of velvet, and bore armorial insignia. The 'coat of arms,' as understood by heraldry in the present day, is nothing more than a relic of the ancient armorial insignia, divested of the coat on which it used to be embroidered. See Shield, Heraldry.

**COAT OF MAIL**, in the armour of the middle ages, was a suit made of metal scales or rings, linked one within another. See Armour.

**CO'ATI**, or **COATI-MONDI** (*Nasua*), a genus of quadrupeds of the family *Ursidæ* (the Bear family); by some naturalists referred to *Viverridæ* (the Civet family), although their *plantigrade* character allies them rather to the former. They are most nearly allied to the racoons, and, like them, are exclusively American. They are chiefly remarkable for the elongation of the snout, which is a sort of flexible proboscis, and is turned about in search of food, and employed in rooting up the earth to obtain worms and insects. They are often domesticated in South America, and are very affectionate, active, troublesome, and amusing.

**CO'BALT** (from *Cobalus*, a malicious sprite or gnome) is a metal of no use in the arts and manufactures, but which forms compounds of commercial importance. C. (symbol Co) is found naturally in combination with arsenic (As) as *Speiss C.* ($CoAs$); in combination with arsenic and sulphur, as *C. Glance*, the arsenide and sulphide of C. ($CoS_2,CoAs$), in ores of Nickel (q. v.); and in the metallic state, it is found in meteoric stones or Aërolites (q. v.). The metal has been obtained in laboratory experiments, and presents a gray colour with a reddish tinge, is highly magnetic, and is as hard and infusible as iron. It is a brittle metal, and forms no alloys of commercial use. The protoxide of C. ($CoO$) is employed in painting on porcelain, for producing a rich blue colour. *Zaffre* is the impure oxide obtained by partially mixing C. ore with two or three times its weight of fine sand. *Smalt* is the term applied to a deep blue glass, which owes its colour to the presence of oxide of C., and which, when reduced to very fine powder, is employed occasionally by laundresses to correct the yellow colour of newly washed linen, and by paper-makers as a blue pigment for staining writing-paper. Smalt is also used in the production of the blue colours in porcelain, pottery glass, encaustic tiles, fresco-painting, &c., and forms the principal ingredient in *Old Sevres Blue, Thenard's Blue, Turquoise Blue,* and *Variegated Blue.* See Blue. A compound containing the oxides of C. and zinc is of a beautiful green colour, and is known as *Rinman's Green.* The chloride of C., dissolved in much water, may be employed as a sympathetic ink. In dilute solutions, it is of a faint pink colour, which is not observable when it is used for writing upon paper; but when heated before the fire, it loses water, and becomes blue, and the writing is then capable of being read. On allowing the paper thereafter to lie in a damp place, or exposing it to the vapour of steam from a kettle, water is again absorbed, and the writing returns to its invisible state. The addition of a little perchloride of iron to the ink, makes the writing appear green; a solution of zinc imparts a red tint; and a salt of copper, a yellow shade.

**CO'BBETT**, William, a celebrated English political writer, was born in March 1762, at Farnham, in Surrey, where his father was a small farmer. From his infancy, he was trained in habits of industry and self-dependence. Taking a dislike to rural occupations, he went to London, where he was employed a few months as a copying-clerk—a kind of employment so distasteful to him, that he enlisted into the 54th Foot, and with it went out to Nova Scotia shortly after. In this regiment he remained about eight years, in the course of which time his uniform good conduct, activity, and intelligence, had secured him the high promotion of sergeant-major. During his soldier-years, he indulged in none of the dissipations common to barrack-life, but devoted the whole of his leisure to the work of self-education. On his return to England, about the end of 1791, he obtained his discharge, married, and went to America in the following year. He settled in Philadelphia, where he commenced his career as a political writer. Under the signature of 'Peter Porcupine,' he was at this early stage as keen a Tory as in later life he was a Radical, and he lashed French republicanism and American democracy with a scorn as coarse and personal sometimes as it was always bitter. In America he was twice prosecuted for libel. He left America in June 1800, and returned to England. In January 1802, appeared the first number of his famous *Weekly Political Register*, which he continued without intermission until his death in 1835. At first, Tory, the *Register* gradually changed its politics, until at last it became the most fierce and determined opponent of the government, then presided over by Pitt, and the most uncompromising champion of Radicalism. In 1810, having previously been twice tried and found guilty of libel on certain members of the government, he was sentenced to imprisonment for two years in Newgate, and to pay a fine of £1000, for having in the *Register* made some severe remarks upon the flogging of five militiamen. In 1817, in consequence of pecuniary embarrassments, and the dread of being sent to Newgate again, under the Six Acts for the suppression of freedom of discussion, C. went once more to America, where he remained more than two years, his articles for the *Register* being transmitted with unfailing regularity across the Atlantic. In 1829—1830, C. delivered political lectures in several of the principal towns of England and Scotland, and everywhere met with a most enthusiastic reception as the boldest and most powerful advocate of the people's rights. In 1832 he was returned to the first reformed parliament as one of the members for Oldham. His speeches in parliament, however, did not add to his reputation. He died June 18, 1835. Among C.'s best known works are his *English Grammar, Rural Rides, Cottage Economy, Advice to Young Men and Women,* and *Parliamentary History.* C. was by no means a man of the first order of intellect; he was shut out altogether from the higher and more refined departments of human thought. But in dealing with matters of common sense merely, he exhibited a native vigour far surpassing that of any writer of his day. Nor can there be any doubt that, in spite of his crotchets and inconsistencies, he rendered lasting service to the cause of the people.

**CO'BDEN**, Richard, an eminent English politician, who has been aptly designated 'the Apostle of Free Trade,' was born at Dunford, near Midhurst, Sussex, in 1804. His father, who was the owner of some little property, which he cultivated himself, died while the subject of this article was yet young, leaving his family in comparatively poor circumstances. Richard was received into a wholesale warehouse belonging to his uncle, where he soon exhibited great aptitude for business. After some time, he became a partner in a Manchester house, his presence here being speedily made manifest by the superior quality and tastefulness of the printed calicoes of the firm. In 1834—1835, C. travelled in Turkey, Greece, and Egypt, and also visited the United States, the result of his travels appearing in two pamphlets, entitled respectively *England, Ireland, and America*, and *Russia;* the latter intended as an antidote against the 'Russophobia' then prevalent. In these pamphlets, he also ridiculed the workings of diplomacy, and asserted England's mission to be the avoidance of war and the extension of commerce. In 1837, he contested unsuccessfully, on free-trade principles, the borough of Stockport; and in 1838 he carried in the Manchester Chamber of Commerce a motion to petition parliament for the repeal of all duties on corn. This was followed by similar action all over the country; and in the following year, petitions bearing some two millions of signatures for the repeal of the corn-laws were carried to London by 200 delegates. The motion of Mr Villiers for repeal being rejected by a large majority of the House of Commons, the friends of free trade determined to form the Anti-corn-law League (q. v.), of which C. became the most active and prominent member. To his lectures all over the country, and his speeches in parliament (to which he was returned in 1841 by the constituency which rejected him in 1837), all characterised by great information, clearness, and acute and convincing reasoning, was in great part due, as Sir Robert Peel acknowledged, the abolition of the corn-laws at so early a period as 1846. Having accomplished this great work, C. again visited the continent, and during his absence he was elected both for Stockport and the West Riding of Yorkshire. He chose the latter constituency, which he continued to represent till 1857, when, on an appeal to the country by Lord Palmerston to support him in his Chinese policy, of which C. was a strenuous opponent, he was rejected. Shortly after the repeal of the corn-laws, the public testified its gratitude to him for the services he rendered in this matter by subscribing for him a magnificent testimonial of between £60,000 and £70,000. C. now gave up business, and devoted himself exclusively to politics. He continued to labour assiduously for the extension of free-trade principles, for parliamentary and financial reform, for repeal of the taxes on knowledge, and was particularly earnest in enunciating national and international peace views; and to this feeling with regard to war, he owed his rejection at the general election of 1857. In 1859, having in the interval, on account of ill health, retired from politics altogether, he was, during his absence in America, elected for Rochdale. Lord Palmerston, who was at this time called upon to form a new ministry, with a just appreciation of the great services which C. had rendered to his country, offered him a seat in the cabinet, which C., as the uncompromising opponent of the noble lord's foreign policy, felt bound to decline. Since his election for Rochdale, the state of his health has not permitted him to take any part in parliamentary proceedings, but as her Majesty's plenipotentiary, he (1859—1860) arranged and concluded a treaty of commerce with France. At present (January 1861), he is seeking relief from a bronchital affection in Algeria.

**COBI′JA**, a town of Bolivia, claims notice chiefly as being the only seaport of the republic. It is situated in lat. 22° 34′ S., long. 70° 21′ W., and forms the capital of the department La Mar. Its population is less than 1000, and its trade inconsiderable, for, besides the disadvantage of an open roadstead to seaward, there extends inland the almost impracticable desert of Atacama. Hence most of the maritime commerce of the state (see Bolivia) passes, and that in the face of transit-duties, through the Peruvian harbours to the northward.

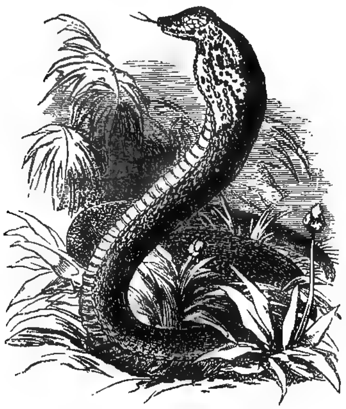
**COBI′TIS.** See Loach.

**CO′BLE, or CO′BBLE,** is a low flat boat with a square stern, mostly used by salmon-fishers.

**COBLENZ**, a city of Rhenish Prussia, beautifully situated at the junction of the Rhine and the Moselle, the former of which is here crossed by a bridge of boats, and the latter by a fine stone bridge. Being the bulwark of Germany against France, C. is defended by extensive fortifications, forming a fortified camp capable of affording accommodation for 100,000 men. For defence-purposes, C. is connected with the almost impregnable castle of Ehrenbreitstein (q. v.), on the opposite side of the Rhine. Several detached forts also guard the city at various points. In the old town of C., many of the streets are irregular, narrow, and dirty; but in the new town they are generally well built, moderately wide, and cleanly. Among its principal buildings are the Church of St Castor, founded early in the 9th c.; the town-hall; the old castle of the Electors of Treves, now converted into a japan-ware manufactory; the king's palace, used as a summer residence; and the government house. C. is a free port, and its favourable position secures it a very active commerce in wine, corn, iron, mineral waters, volcanic products for millstones, &c. Its principal manufactures are linen and cotton fabrics, japan-ware, and furniture. Many of the inhabitants are also employed in vine-culture. Population, including a garrison of about 5000 men, 28,000. C. was known to the Romans as *Confluentes.*

**CO′B-NUT**, a name given to some of the largest and finest cultivated varieties of the Hazel-nut (q. v.).—In the West Indies, the name C. is given to the fruit of *Omphalea triandra*, a tree of the natural order *Euphorbiaceæ.* It is also called Hog-nut. The tree has a white juice, which turns black in drying, and in Guiana is used instead of ink. The fruit is a three-celled capsule, each cell containing one seed or nut, which, if the embryo is retained, has very cathartic properties, but after its extraction, is wholesome and pleasant.

**CO′BRA DA CAPE′LLO**, a name sometimes limited to the *Naja tripudians*, and sometimes extended to all the species of the genus *Naja*, very venomous serpents of the family *Viperidæ*, remarkable for the faculty of dilating the back and sides of the neck, which they do when angry or otherwise excited, and to which they owe their popular name, originally Portuguese, and signifying *hooded snake;* the elevated skin of the back of the neck presenting, when the animal is viewed in front, much the appearance of a hood. It is usually three or four feet long, of a pale rusty-brown colour above, and bluish or yellowish-white below, and is characterised by a singular mark on the back of the neck, closely resembling the figure of an old-fashioned pair of spectacles, from which the animal sometimes receives the name of the *Spectacle Snake.* The C. da C. preys on lizards and other small animals. It is usually a sluggish creature, and is easily killed, even by means of a small stick or a whip. Its venom is extremely powerful, its bite causing death in two hours or less. Yet it is little disposed to use its fangs, except for the purpose of providing itself with food. The C. da C. is often to be found in the vicinity of human dwellings in the East Indies, and even in the houses themselves, attracted apparently by the young of the domestic poultry, and by the moisture of the wells and drainage. When one is found in or near a house, its mate is seldom far off. The Singhalese, when obliged to leave their houses in the dark, carry a small stick with a loose ring, the noise of which, as they strike it on the ground, warns the snakes to leave the path. The poison of the C. da C. is secreted in a large gland in the head of the serpent, which, when the animal compresses its mouth upon any object, flows through a cavity of the tooth into the wound. The poison, though most deadly when introduced into the system through a wound, possesses the curious property of being perfectly harmless if taken internally. It has a sharp taste, but no odour. Olive oil applied externally, and ammonia taken internally, are the best antidotes for wounds from the cobra da capello. For further particulars regarding the C. da C., see Buckland's interesting work, the *Curiosities of Natural History* (Lond. Bentley).—The other species of *Naja* are found in the warm parts of Asia, Africa, and Australia.



Cobra da Capello.

**CO'BURG**, a town of Central Germany, in the duchy of Saxe-Coburg-Gotha, picturesquely situated on the left bank of the Itz, a tributary of the Regen, in lat. 50° 15′ N., and long. 10° 58′ E. In the market-place are some striking old buildings, but the general appearance of the houses is one of cleanliness and comfort. C. is one of the chief ducal residences, and the palace, a Gothic edifice, erected in 1549, is one of the principal buildings in the town. The old castle of the Dukes of Coburg, now partly used as a house of correction and prison, occupies a commanding height more than 500 feet above the town. The rooms, and the bed which Luther occupied when in concealment here in 1530, are still exhibited to the visitor, as well as the pulpit from which he preached in the chapel of the castle. During the Thirty Years' War, the castle was ineffectually besieged by Wallenstein. C., which is the seat of all the high courts of the duchy, has manufactures of woollen, linen, cotton, marquetry, and gold and silver articles, also dye and bleaching works. Pop. 10,000.

**COBURG PENINSULA**, the most northerly part of Australia to the west of the Gulf of Carpentaria, runs out in a north-west direction towards Melville Island, from which it is divided by Dundas Strait. On its north-east side is the bay, known as Port Essington, at the head of which, about lat. 11° 22′ S., long. 132° 10′ E., was established, in 1839, the settlement of Victoria—abandoned, on account of its insalubrity, six years thereafter.

**CO'CA** (*Erythroxylon Coca*), a shrub of the natural order *Erythroxylaceæ*, of which the leaves are much used by the inhabitants of Peru and Bolivia as a narcotic and stimulant. The dried leaves are chewed with a little finely powdered unslaked lime, or with the alkaline ashes of the quinoa (q. v.), or certain other plants. An infusion is also occasionally used. The properties and effects of C. resemble those of opium, although it is less narcotic, whilst it possesses the property of dilating the pupil of the eye, which opium does not possess. It also lessens the desire for ordinary food, and for some time, at least, enables the person who uses it to endure greater and more protracted exertion than he otherwise could, and with less food. It is especially remarkable for its property of preventing the difficulty of respiration, so common in the ascent of long and steep slopes at great elevations. But when used habitually and in excess, it weakens the digestion, produces biliary and other disorders, and finally induces a miserable ruin both of body and mind. It has been in use from a very remote period among the Indians of South America, and was extensively cultivated before the Spanish conquest. Many of the Indians of the Peruvian Andes are to this day excessively addicted to it, and its use is quite general among them, besides prevailing to a considerable extent among the other inhabitants of the same regions. Its culture and use have extended into Brazil and the countries on the banks of the Amazon, and it is supposed that about 30,000,000 lbs. of the dried leaf are consumed in a year, about 10,000,000 of the human race partaking in the indulgence.

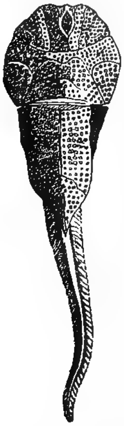
**COCCE'JI**, Heinrich Freiherr von, born at Bremen, March 25, 1644, studied jurisprudence and philosophy in Leyden from 1667 to 1670, and went from thence to England. In 1672, he was made professor of the law of nations at Heidelberg; in 1689, he accepted the professorship of jurisprudence at Utrecht; and, in the following year, was appointed to a similar office at Frankfort-on-the-Oder. In 1713, the emperor named him a baron of the realm, on account of his good management of several important affairs. C. died August 17, 1719. As an erudite jurist, C. was the oracle of many courts, and his work on German civil law (*Juris publici prudentia*, 1695) was almost universally used as an academical text-book for this branch of jurisprudence.—His youngest son, Samuel, born at Heidelberg in 1679, acquired no less renown. He, too, in 1703, became professor at Frankfort-on-the-Oder, and afterwards filled several honourable state-offices. At last, he was appointed great chancellor, in which function he died, October 22, 1755. His reform of the Prussian administration of justice, and his *Codex Fridericianus* (Berlin, 1747—1750), are among the greatest benefits his country owes him.

**COCCE'JUS**, or **COCK**, Johannes, a distinguished theologian, was born at Bremen, August 9, 1603. After preparatory studies in his native place, he, in 1625, went to Hamburg, where he studied Hebrew. From thence he went to Franeker in 1629. Returning to Bremen in 1630, C. was appointed professor of Hebrew at the Athenæum of his native place; called to Franeker for the same office in 1636, and in 1643 appointed professor of theology also. In 1650 he was called to Leyden, where he filled the chair of theology till his death, November 5, 1669.

C.'s chief work is the *Lexicon et Commentarius Sermonis Hebraici et Chaldaici Veteris Testamenti* (Leyden, 1669) the first tolerably complete dictionary of the Hebrew language. The irrelevant and inaccurate matter which it originally contained, has been weeded out in the course of time by more skilful editors. In spite of his great learning, C. held very peculiar hermeneutical principles, which enabled him to discover the whole New Testament in the Old. The result, of course, was that he virtually transferred the language of the Old Testament to the New. The representation abundantly employed in the former of a covenant between God and man, usurped the place of the New Testament doctrine of the Fatherhood and Sonship; and his theology is simply a modern renewal of the old attempt to Judaise Christianity, which Paul denounced and condemned. C. carried the covenant theology, as it is called, to an absurd extreme. The book in which he expounds his views most completely, is his *Summa Doctrinæ de Fœdere et Testamento Dei* (Leyden, 1648). C.'s principal antagonists were Voetius and Desmarets.

**COCCINE'LLA.** See Lady-bird.

**CO'CCO, CO'COA ROOT**, or **E'DDOES**, plants of the genus *Colocasia*, and of the nearly allied genus *Caladium*, of the natural order *Araceæ*, very generally cultivated in tropical and sub-tropical countries for their roots, or flat underground corms, which abound in starch, and are used as articles of food, being deprived by roasting or boiling of the characteristic acridity of the order, which, indeed, some of them possess in a comparatively small degree. They are sometimes included under the name *Yam*, but are totally different from the true yams. The names Cocco, Cocoa Root, and Eddoes, perhaps more strictly belong to *Colocasia antiquorum*, a stemless plant with ovate leaves, and flowers enclosed in a cylindrical erect spathe. The taste of its roots is like that of potatoes. *Colocasia esculenta* is a similar plant, a native of tropical America, and is much cultivated. *Colocasia macrorhiza* is the Tara (q. v.) of the South Sea Islands. In the Himalaya, *C. Himalensis* forms the principal food of many of the inhabitants. The root in its recent state is stimulant, diaphoretic, and expectorant.


Coccosteus.

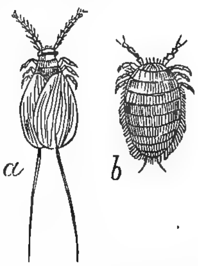
**COCCOLOBA.** See Seaside Grape.

**COCCO'STËUS**, a genus of fossil fishes, peculiar to the Devonian measures. It was nearly related to Cephalaspis (q. v.), but differed in having, in addition to the bony helmet of that genus, a cuirass covering both the dorsal and ventral aspects of the body as far down as the origin of the dorsal fin, from which to the tail—comprising more than one-half the entire length of the animal—all seems to have been exposed without the protection even of a scale. In a well-preserved specimen in the British Museum, the remains of the endoskeleton can be detected. Seven species have been described from the bituminous schists of the Old Red Sandstone of the north of Scotland.

**COCCOTHRAU'STÉS.** See Hawfinch.

**CO'CCULUS I'NDICUS**, the name given commonly, and in the pharmacopœias, to a very poisonous seed, brought from the East Indies, which is used for various medicinal purposes, and illegally in the preparation of malt liquors. It possesses acrid and intoxicating qualities. It is used in India for stupifying fish, that they may be taken by the hand. An ointment made with it is a very efficacious remedy for ring-worm. It contains a most poisonous principle, called *Picrotoxine*, whilst the pericarp contains another called *Menispermine*, equally poisonous. It is the seed of the *Anamirta Cocculus*, a beautiful climbing plant, of the natural order *Menispermaceæ*. It imparts to beer its bitter taste, and at the same time a fulness and apparent richness, but renders it very deleterious in its effects. It is used to a considerable extent in Britain, notwithstanding its prohibition by act of parliament, and especially in the cheaper kinds of strong ale, by which the dishonest brewer contrives to save part both of the malt and of the hops that would otherwise be required. It is not easy of detection by chemical tests.—The genus *Anamirta* is closely allied to the genus *Cocculus* (see Calumba), in which it was formerly included. The fruit of several allied species possesses properties analogous to those of the *A. Cocculus*.

**CO'CCUS** (Gr. *kokkos*, kermes), a genus of insects of the order *Hemiptera*, sub-order *Homoptera*, the type of a family, *Coccidæ*, allied to the *Aphis* (q. v.) family, although in many respects very distinct. The *Coccidæ* are sometimes called *Scale insects*, and by the French *gallinsectes* (Latinised by some entomologists into *Gallinsecta*), but they are not to be confounded with the insects called gall-flies (*Cynipidæ* or *Gallicolæ*), which produce *galls* or nut-galls. The *Coccidæ* are very numerous, and are attached to particular plants, on the juices of which they feed, often producing much mischief by the flow and loss of sap which their punctures occasion, and giving great trouble to gardeners, who find it very difficult to free their plants, particularly in hot-houses, from the *scale*, the *mealy bug*, the *vine-gall*, &c. Various washes, consisting of soap, sulphur, tobacco, &c., are employed for this purpose; but moist heat, or as much exposure to steam as the plant can bear, has been found in many cases the most efficacious remedy. The destructive Coffee-bug belongs to this family. The male *Coccidæ* are winged insects, having only two wings, which shut horizontally upon the body; the abdomen is terminated by two threads. The females are wingless. It is not well known how the males subsist, as they have no apparent organs for sucking juices or eating any sort of food. The females have a beak, which they insert into plants in order to suck their juices. This interesting family of insects contains not only many troublesome species, but some which are of great value, particularly for the beautiful dyes which they yield. These dyes are obtained from the bodies of the female insects. Among them are Cochineal (q. v.) and Kermes (q. v.). A species of C. (*C. Polonicus*), which lives on the roots of the Knawel (*Scleranthus perennis*), yields the Scarlet Grains of Poland, a considerable article of commerce before cochineal was introduced into Europe; and a species which feeds on the roots of the burnet (*Poterium Sanguisorba*), was in like manner used by the Moors for dyeing



Cochineal Insect (*Coccus cacti*):
*a*, male; *b*, female.

silk and wool of a rose colour. Other species produce Lac (q. v.) and wax. See WAX INSECTS.

**COCCY'ZUS.** See CUCKOO.

**COCHABA'MBA**, a name of various application in Bolivia.—1. A river which forms one of the head-waters of the Amazon.—2. A city on the foregoing river, lying 145 miles to the north-north-west of Chuquisaca, the chief city of the Bolivian republic, and containing about 40,000 inhabitants. It has a temperate and healthy climate, and is engaged in the manufacture of cotton fabrics and glass wares.—3. A department, of which the city just described is the capital, in lat. 17°—19° S., long. 65°—68° W. With an area of 55,000 square miles, it had a population, in 1858, of 350,000. In addition to the precious metals, it yields cotton, sugar, dyewoods, and timber.

**CO'CHIN**, a protected state of Hindustan under the presidency of Madras, lat. 9° 48′—10° 50′ N., long. 76° 5′—76° 58′ E. With Malabar on its N.W. and N., and Travancore on its E. and S., it fronts the Arabian Sea on the S.W., and meets Coimbatore towards the N.E. on the water-shed of the Western Ghauts. It contains 1988 square miles, and 288,176 inhabitants. Its hydrography is singular. The Western Ghauts, which have here an elevation of fully 4000 feet, intercept the south-west monsoon, and render the coast one of the most humid regions in the world during June, July, August, and September; while even during the remaining eight months, anything like an unremitting drought is unknown. As the space between the mountains and the sea is almost on a level with the tide, the countless streams have each two contrasted sections—the plunging torrent that breaks into comparatively short pieces the magnificent trunks of teak with which it is freighted; and the sluggish brook which, however it may vary, according to the season, in breadth and depth, pretty uniformly results in a brackish estuary. Further, these estuaries, almost continuously breasted by a narrow belt of higher ground, form between them a backwater or lagoon of 120 miles in length, and of every width between a few hundred yards and 10 miles, which communicates at only three points with the ocean. The population, also, is peculiar in its composition, more especially as compared with that of the more easterly parts of the peninsula. The great mass of the population are Hindus, but there are also Mohammedans, and a large number of Christians and Jews. The Jews are classified into white and black; and the Christians, divided between the Syrian and Romish Churches, trace their origin partly to the Portuguese conquest, and partly to the missionary labours of St Thomas the Apostle. Both the places of worship and the seminaries of education throw light on the relative numbers of the different parties. The latter, 95 in all, are—English, 5; Malayalam, 69; Tamul, 9; Mahratta, 1; Sanscrit, 7; and Hebrew, 4. The former are—Hindu, 2734; Mohammedan, 31; Jewish, 8; and Christian, 108. Besides the teak, already mentioned, the mountains yield the peon, a sort of pine which makes excellent masts; and the low country produces rice, pepper, cardamoms, ginger, betel-nut, yams, arrow-root, and sweet potatoes.

**COCHIN**, once the capital of the principality above described, but now a seaport of the district of Malabar, in the presidency of Madras, stands in lat. 9° 58′ N., and long. 76° 18′ E., on the south side of the principal channel, between the open ocean and the backwater mentioned in the preceding article. As this lake, so to speak, is, even in its lowest state, always navigable for canoes, its value, as a means of communicating with the interior, can hardly be overrated in a country where roads and bridges are nearly out of the question. The harbour affords a depth of fully 25 feet. It has, however, a bar with barely 15 feet on it, on which, during the south-west monsoon, the surf breaks so violently, that neither ingress nor egress can be safely attempted. Still its navigable facilities, connected with the inexhaustible forests of the Western Ghauts, have long placed C. next to Bombay on this coast with respect to ship-building and maritime commerce. Here the Portuguese erected their first fort in India in 1503. They were supplanted by the Dutch in 1663—the epoch also of the transfer of Bombay to Charles II. In 1796, C. was captured by the British, and about ten years after, its fortifications and public buildings were destroyed, and its private dwellings very much damaged. Notwithstanding this check, the place continued to flourish; many merchant vessels, ranging upwards to 1000 tons, have been built; and, besides ships of war for the local navy, 3 frigates have been launched for the imperial service. The population of the city, numbering about 30,000, is more heterogeneous than even that of the state of the same name, the additional elements being Dutch, Armenian, Arabian, and Persian. The wells are mostly brackish. Hence, while the health of the inhabitants at large is seriously affected, the government imports for its own servants fresh water from a river at a distance. The average temperature is 78° Fahrenheit.

**CO'CHIN CHI'NA**, or **ANA'M**, an empire of Asia, occupying the eastern portion of the Indo-Chinese Peninsula. It lies in 8° 40′—23° N. lat. and 102°—109° E. long., and includes Tonquin, Cochin China Proper, the eastern and southern part of Cambodia, together with the little state of Siampa, and several islands in the China Sea. It is bounded, N. by China, E. by the Gulf of Tonquin and the China Sea, S. by the China Sea, and W. by Laos and Siam.

*Physical Features.*—A mountain-range of considerable height runs through the country, parallel with the coast, and terminates in Cape St James. Offshoots from this intersect the maritime district lying between 10° 20′ and 17° N. lat., and the whole country east of the great range, from 15° to 19° 30′, consists of plains alternating with mountain-ridges. The northern province of Tonquin is an extensive plain, through which flows the river Song-ca; and it is surrounded, except towards the sea, by mountains. C. C. Proper extends along the coast between 11° and 18° N. lat. Cambodia, or that part of it which forms a part of the Cochin Chinese empire, is a level country fertilised by the alluvium of the Cambodia river. The largest river of Anam, and indeed of the whole Indo-Chinese peninsula, is the Ma-kiang or Cambodia, which, rising in the mountains of China, flows through Laos and Cambodia, and, after a course of some 1500 miles, separates into several branches, and finally discharges itself into the China Sea. The Saïgon or Donnai river traverses the country to the eastward of the Ma-kiang, with which it is connected. The Song-ca, or Great River, of Tonquin, has an estimated course of 400 miles. The Hué, in C. C. Proper, flows through a fertile valley, and presents some of the finest scenery in Asia.

The *climate* of the Cambodian plains has been compared to that of Bengal. In Tonquin, the changes of temperature and weather are very sudden. Much rain falls in C. C. during the whole summer, which produces a general inundation about the end of October. September, October, and

November are the best months of the year, and most suited to the European constitution.

Amongst the *agricultural productions*, rice, of which two crops are raised in the year, holds the chief place. Potatoes, pease, beans, melons, and other vegetables, maize, tobacco, cotton, indigo, tea, and sugar, are also grown. Silk is produced in considerable quantities. Valuable trees, such as the calumba, ki-nam or scented eagle-wood, ebony, rose-wood, iron-wood, sandal-wood, the varnish-tree, and many others, flourish on the mountains. The palm-tribe and the bamboo are common in the low lands. The *mineral* riches of the country are very much neglected; but gold, silver, iron, copper, and coal exist, and are most abundant in Tonquin. The *domestic* animals are the elephant, Indian cow, buffaloes, pigs, goats, dogs, and cats. Fowls, of that kind so lately a rage in this country, ducks, geese, and pigeons, abound in every village.

The most dreaded of the *wild animals* of C. C. is the tiger. Elephants are very numerous in the forests of Tonquin; and leopards, wolves, bears, wild-boars, the rhinoceros, as well as many kinds of apes and monkeys, infest the mountainous districts. Serpents and other reptiles are to be met with in great numbers. Of *birds*, eagles, peacocks, quails, partridges, paroquets, and wild-ducks are amongst the most important. Fish of very excellent quality swarm in the rivers and canals. Very many are taken on the sea-coast, and carried to every part of the country.

*Inhabitants.*—The Cochin Chinese, like the other peoples of the Indo-Chinese Peninsula, are characterised by a Mongolian physiognomy and a monosyllabic language. They are rather low in stature —Finlayson found the average height of 21 men to be 5 feet 3¾ inches—but well proportioned, hardy, and active. A skull rather globular than square, a large mouth, prominent lips, black hair, a yellowish-brown complexion, and a scanty beard, are peculiar to the race. The countenance is round; and the common people have generally a good-humoured cheerful expression, but the higher classes affect the solemn and decorous. The women have a lighter skin, and are altogether better-looking than the men. Their dress is the old national costume of the Chinese prior to the Tartar conquest, and consists, both for men and women, of a loose frock, and trousers of silk or cotton. The hair, which is worn long, is confined in a roll at the back of the head. Turbans of crape—black for the men, and blue for the women—are general, though a kerchief often serves instead. The Cochin Chinese are greatly addicted to smoking, and betel-nut is the universal masticatory.

The civilisation of this people has been derived from China; hence their religion and government, manners and customs, nearly approximate to the creeds, administrative system, and habits of that country. The three national religions of China—Confucianism, Buddhism, and Taouism, or modifications of these—are more or less prevalent; and as amongst the Chinese, the adoration of ancestors is common to all classes. The selection of a place of sepulture is a very grave consideration, and the good or bad fortune of a family is supposed to depend upon it. The French Catholic missionaries are said to have made some 400,000 or 500,000 converts. About six miles from Touran are the sacred mountains of marble, in which is a subterranean Buddhist temple of solemn magnificence, 50 feet long by 40 feet wide, and 45 feet in height.

Rice, with a sauce called balachiam, made of macerated salt fish, is the principal food of the Cochin Chinese; but they are very unclean feeders, no flying or creeping thing, whether bat, insect, or reptile, coming amiss. The national drink is tea; but a liquor made from rice is also in use. The common dwellings, which are raised two or three feet from the ground, are made of bamboo and thatch; but the better classes inhabit brick-houses roofed with tiles. Women in C. C. are allowed full liberty, and frequently engage in commerce and agriculture. They are kind to their children, and proud of a numerous offspring. Infanticide is unknown, but the poor sometimes sell the children they cannot afford to keep. Marriages are regulated by law; and before they can be contracted, the consent of the head of the family is required. Polygamy, or rather a system of concubinage, is allowed, but obtains chiefly among the rich. Divorce is also permitted. The laws against adultery are very severe, yet amongst single women little or no disgrace attends a breach of chastity. The law invests the creditor with the most arbitrary power over the property, wives, and family of his debtor.

The inhabitants of Tonquin and C. C. are essentially one people; but the Siampese or Loys differ from these in many respects. They have Jewish traditions, observe circumcision, worship no idol, and observe a day of rest. The Cambodians speak a different language, and bear a great resemblance to the Siamese. In the mountainous parts of the Anamitic empire are certain rude tribes, who are without a religion or any notion of a God. The total population of C. C. and dependent countries has been estimated at 30,000,000, but on no very correct data. The learned and official language of the country is Chinese.

*Government and Administration.*—These are after the Chinese model. The emperor is absolute, but he must govern according to the laws. He is assisted by a supreme council of high mandarins, six of whom are his ministers. The government officials are divided into military and civil, or literary mandarins. The former have the precedency; and from them the emperor selects his ambassadors, governor-generals, and viceroys.

For *administrative purposes*, the country is divided into provinces, departments, districts, and villages. A military governor or viceroy, and two high civil mandarins, reside at every provincial capital; and the minor divisions have each their regular number of officials, who are appointed by the supreme government. The laws are very arbitrary. The bastinado system is in full force; indeed, the bamboo may be regarded as a political and social institution. The mandarins, as a class, are described as very corrupt.

In 1800, the Emperor Gia-Loung possessed an *army* of 113,000 men, and a marine of 26,800, making a total force of 139,800 men. At the present time there is said to be a royal guard of forty regiments (each numbering 600 men), and to which 800 elephants are attached. There are also five legions of five regiments each, besides a local militia.

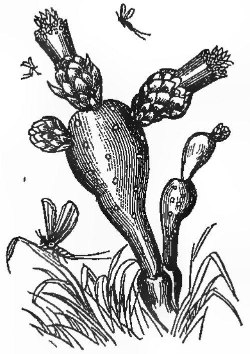
The capital of the whole empire is Huĕ, or Huah.

The foreign *commerce* of C. C. is carried on chiefly with China, the Portuguese settlement of Macao, Bankok, and Singapore. Forty Cochin Chinese junks annually visit that port and the British Straits' Settlements.

*History.*—Previous to the Mongol invasion of China, Tonquin formed a part of that empire, but at that time it threw off its allegiance. The Anamitic sovereign now, indeed, acknowledges the Emperor of China as his superior, yet his vassalage is little more than nominal. The present inhabitants of C. C. Proper are said to be descendants of political refugees from Tonquin. In 1774, a revolution in the former country deprived the reigning monarch, Gia-Loung, of his throne, but in 1790, assisted by some European adventurers, he not only re-established his power in C. C., but added Tonquin to his dominions. The treaty of 1787, which Louis XVI. concluded with Gia-Loung or his agents, and by which the French king agreed to afford military assistance in return for a cession of territory, he was unable to carry out in consequence of the political troubles in his own country. In 1809, Gia-Loung acquired the best part of Cambodia; and after carrying out many great reforms, in a Peter-the-Great fashion, died in 1819. His successors persecuted the French missionaries and their converts. The present monarch, Tu-duk, adopted the same line of policy, but has been called to account for so doing. Ostensibly to revenge the death of some Catholic missionaries, and the destruction of their churches and convents, a French and Spanish expedition was despatched to C. C. in 1858. On the 1st of September of that year, the fortifications of Touran were carried by assault. Saïgon and its citadel were taken the following February. France had long coveted some convenient port in or adjacent to the China Seas; but her acquisitions in C. C. need hardly excite jealousy.—*La Cochinchine et le Tonquin; le Pays, l'Histoire, et les Missions, par Eugène Veuillot* (Paris, 1859); Finlayson's *Journal of the Mission to Siam and Hué, the capital of Cochin China, in the years* 1821—1822.

**CO'CHINEAL**, a dyestuff employed in dyeing scarlet and crimson, and in the preparation of Carmine (q. v.) and Lake (q. v.).

C. consists simply of the bodies of the females of a species of *Coccus* (q. v.), called *C. cacti*, because it feeds upon plants of the *Cactus* family, particularly on one, therefore designated the C. plant, but known in Mexico as the Nopal (*Opuntia cochinillifera*), figured in the article Cacteæ. This plant is nearly allied to the prickly pear. It assumes a somewhat tree-like form. Its fruit, although eatable, is very inferior to that of the prickly pear. It is a native of Mexico and other warm parts of America, and is assiduously cultivated, in order to what may be called the cultivation of the valuable insect which it supports. This cultivation was carried on by the Mexicans long before the country was known to Europeans. It is now carried on also in some parts of the West Indies, and in the island of Teneriffe. The C. plant and insect have been introduced into Algeria; but no considerable success has yet attended the attempts to introduce them into the East Indies, although the East India Company once offered a reward of £6000 for their introduction.—Other species of *Opuntia* appear to be as suitable for the C. insect as *O. cochinillifera*, particularly *O. Hernandezii*, which is employed in Mexico, and *O. Tuna*, which is chiefly used in Peru.



Cochineal or Nopal Cactus and Cochineal Insect.

The C. insect is a small creature, a pound of C. being calculated to contain 70,000 in a dried state. The male is of a deep red colour, and has white wings. The female, which is wingless, is of a deep brown colour, covered with a white powder; flat beneath, convex above. When a plantation of the C. plant has been formed—by cuttings which are ready to receive the insect in eighteen months—the cultivator (*nopalero*) procures branches laden with C. insects; and keeping the branches, of which their succulency admits, till the mother-insects have laid their eggs, he places their bodies, with the eggs which they cover, in little nests formed of some cottony substance upon the C. plants, and the young insects, when hatched, soon spread over them. The gathering of the C. is very tedious, and is accomplished by brushing the branches with the tail of a squirrel or other animal. The insects are killed by boiling water, by heating them in ovens, or by exposure to the heat of the sun. They must be speedily killed, to prevent them from laying their eggs, which diminishes their value. When killed and dried, they may be kept for any length of time without injury. The different appearances presented by C. as brought to market, are ascribed to the different modes of killing the insect. C. is one of the most important exports of Mexico.

**CO'CHLĔA.** See Ear.

**COCHLĔA'RIA.** See Scurvy-Grass.

**COCK**, properly, the name of the male of the common domestic fowl (see Fowl), but very generally extended to the males of other kinds of gallinaceous birds, and not unfrequently employed as a distinctive appellation of the males even of some kinds of small birds.

The ancients regarded the domestic C. as the companion of Mars, and in heraldry he is the emblem of strife, of haughtiness, of quarrels, and of victory. Guillim has the following quaint eulogium on the cock: 'As some account the eagle the queen, and the swallow or wagtail the lady, so may I term this the knight among birds, being both of noble courage, and also prepared evermore to the battle, having his comb for a helmet, his sharp and crooked bill for a falchion to slash and wound his enemy; and as a complete soldier armed cap-à-pie, he has his legs armed with spurs, giving example to the valiant soldier to expel danger by fight, and not by flight. The cock croweth when he is victor, and giveth a testimony of his conquest. If he is vanquished, he shunneth the light and society of men!' The C. is said to have been the emblem of the ancient Gauls, who wore it on their helmets for a crest; and though the tradition does not rest on the authority of any medal or other monument, and is supposed to have been a mere play of words between Gallus, a cock, and Gallus, a Gaul, the C. was placed, after the Revolution, on the flags and ensigns of France.

As the emblem of watchfulness, the image of the C. was placed on the summits of church-steeples from a very early period. It is introduced by artists amongst the emblems of our Lord's passion, in allusion to St Peter's sin, and for the same reason it is St Peter's own emblem.

Cock Divination, or Alectromancy, is a method of divining in which a young white cock was made the principal actor. The plan pursued was to describe a circle, and divide it into as many equal parts as there are letters in the alphabet. Upon each of the spaces marked by its respective letter, a grain of corn was placed; and the letters from which the fowl picked the grains, when put together, formed the name of the person about whom inquiry was made.

**COCKA'DE** (Fr. *cocarde*, or *coquarde*). According to Wedgwood, the word signified originally a cocked-hat, or a hat with the broad flap looped up on one side, and was then applied to the knot of ribbon with which the loop was ornamented. Another view is, that it is derived from *coquart*, a beau, one fond of gay trappings. The word is now, however, restricted to signify an appendage to the head-dress worn as a military or naval distinction.

Badges of distinction were early had recourse to in party and civil warfare. A sprig of broom (*planta genista*) was the badge of the House of Plantagenet. In England, during the wars between the Houses of York and Lancaster, the adherents of the former party were distinguished by a white and the latter by a red rose worn in the cap.

The party organised at the court of Charles IX. of France to perpetrate the massacre of St Bartholomew, recognised one another by a paper cross. The faction of the *Fronde*, opposed to Cardinal Mazarin, wore stalks of corn for the same purpose; and certain military bands were called *Lances vertes*, from decorating their lances with green twigs. The use of cockades, as marks of distinction in campaigns and battles, became very general about the beginning of the 18th century. Eugene and Marlborough gave the Germans, English, and Dutch, composing their army, a tuft of corn or grass as their signal or cockade. The use of the C. began to be more fixed in the War of Succession. White being the colour of France, and red of Spain, the two colours were united in the C. of the combined army. At last, in 1767, an authoritative regulation determined that every French soldier should wear a C. of white stuff; and in 1782, cockades were prohibited to all but soldiers. From this time till the Revolution, the C. was an exclusively military badge; and, both in France and England, 'to mount the cockade' was synonymous with becoming a soldier. But in the enthusiasm of 1789, the citizens of France generally assumed the tricolored ribbon as the badge of nationality and patriotism, which was soon also given to the army. The three colours were blue, white, and red: white had long been the colour of France and its kings; blue and red were the colours of Paris. At the Restoration, the white C. of the monarchy again took its place, but had to give way once more to the tricolor, which continues to be the C. of the French army.

Black, with some distinction, enters into the cockades of the German nations. The Austrian is black and yellow; the Prussian, black and white; the Hanoverian, black. After the German war of liberation in 1813, a national C. of black, red, and gold came into general use, and was afterwards assumed by the military and by officials. The wearing of these German cockades was prohibited in 1832, by a resolution of the German Diet; but in 1848 they were again introduced, not only by patriots as a badge of German union, but into the armies. Since 1850, the German C. has disappeared, with other signs of the revolution. The national colours of Belgium are black, yellow, and red. Cockades of these colours were worn by almost the whole population of Brussels on occasion of the constitutional festival, July 21, 1860.

The continental C. is generally in the shape of a flat disc, sometimes of metal, sometimes of silk or other stuff, with the colours disposed concentrically.

In England, the badge of the Stuarts was a white rose; and after the expulsion of the family, the white C. became the distinctive mark of the adherents of the exiled family, in opposition to the orange of Nassau and the black of Hanover: it is a favourite theme in Jacobite songs. With regard to the black C. (a star-like piece of black leather, usually surmounted by a fan), to be seen on the hats of many gentlemen's servants, it appears to be a dubious point who are entitled to assume such a distinction. It is usually held that the privilege is confined to military and naval officers, or those who by courtesy may be regarded as such—the theory being, that the servant is a private soldier, which often is actually the case. But even such an authority as Sir Bernard Burke expresses a very hesitating opinion on the matter. According to a writer in *Notes and Queries* (see vol. vii., 2d series, which contains several communications on this point), the black C. was unknown in this country before the accession of George I., who introduced it from his German dominions. As it is thus the badge of the reigning dynasty, he considers that not military and naval officers alone, but all retainers of the crown (privy-councillors, deputy-lieutenants, &c.), are entitled to the distinction.

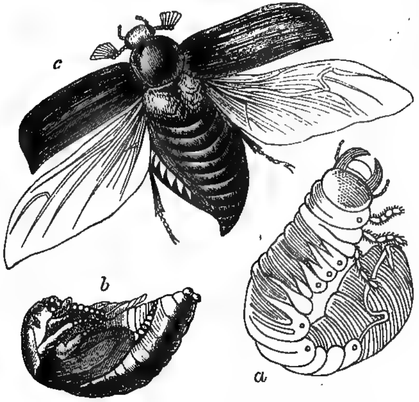
COCKATOO' (*Plyctolophus*), a genus of birds of the parrot-family, or *Psittacidæ*, distinguished from parrots by the greater height of the bill, and its being curved from the base, and by the lengthened, broad, and rounded tail. The head is also large, and in the true cockatoos is surmounted by a crest of long and pointed feathers, with their tips directed forwards, which can be erected and expanded like a fan or depressed at the pleasure of the bird. The true cockatoos are also all of generally whitish plumage, but often finely tinged with red, orange, and other colours, or mixed with these colours in more brilliant display. But the name C. is also commonly extended to nearly allied genera, as *Calyptorhynchus* and *Microglossus*, in both of which the plumage is generally dark, and to which belong the *black cockatoos* of Australia and of the Indian archipelago. The genus *Microglossus*, to which belongs the Great Black C., or Giant C. of New Guinea, is remarkable for the structure of the tongue, which is cylindrical, tubular, capable of being greatly protruded from the mouth, and terminates in a cloven horny tip. All the cockatoos are natives of the regions already named. They abound in Australia. They live not only on fruits and seeds, but partly on insect larvæ. Some of them are frequently to be seen in confinement in Europe, particularly the Lesser Sulphur-crested C. (*Plyctolophus sulphureus*), which, although of comparatively tame plumage, is a general favourite on account of its docility. None of the cockatoos learn to speak many words. Their name is derived from their own proper cry.

CO'CKATRICE, one of the fabulous monsters, a belief in the existence of which prevailed among the ancients and during the middle ages. It was sometimes distinguished from, and sometimes identified with, the basilisk. It was always regarded as possessing similar deadly powers. Its monstrous generation has already been noticed in the article Basilisk. For protection against it, travellers in Africa are said to have carried with them its relative, the cock, the crowing of which caused it instantly to expire. The word C. is sometimes used in the English version of the Old Testament. Perhaps all that can safely be affirmed of the meaning of the original Hebrew, is that it is the name of a venomous serpent. In heraldry, the C. is an imaginary monster, with the wings of a fowl and the tail of a serpent.

CO'CKBURN, Henry, a Scottish advocate and judge, was born at Edinburgh on October 26, 1779. At the age of eight, C. began attendance at the High School of Edinburgh, but exhibited no indications of extraordinary abilities. Sent to the university of Edinburgh at the age of fourteen, his powers began to develop themselves; and though never distinguished as a student, he became the companion of men like Brougham, Horner, and Jeffrey, from whom he imbibed liberal opinions, greatly to the annoyance of the hereditary Toryism of his family. He was called to the Scottish Bar in 1800, and after seven years spent in becoming patience, according to the manner of his profession, he was appointed, by his relative Lord Melville, one of the advocates whose duty it is to assist the Lord Advocate in the prosecution of criminal offenders. Though the appointment was conventionally a political one, and though the party to whom C. was opposed was then in power, he was persuaded to hold the office, as it had in itself really nothing of a political character, upon the understanding that his own views were not to be compromised. It was expected, however, that he would give up his liberalism; and when this expectation was disappointed, advantage was taken, about four years after, of some trivial excuse to dismiss Cockburn. Not till the introduction of jury trial in civil causes into Scotland in 1816, did C. find opportunity for remunerative professional employment. His powers were better adapted for success with a popular, than with a professional tribunal. Extremely simple, clear, and impressive, at times humorous, at times pathetic, always unaffected, and, when he pleased, eloquent, he urged his side of the question with so much earnestness and candour, that the effect was almost irresistible. Under the Grey ministry of 1830, he was appointed Solicitor-general for Scotland; and four years later, he was made one of the judges of the Scottish supreme civil and criminal courts, and took, according to the Scottish custom, the title of Lord Cockburn. He died 26th April 1854, at his residence of Bonaly, in the neighbourhood of Edinburgh.

The efforts of C. as an author were not numerous. He contributed to the *Edinburgh Review* a few articles, having, it would seem, chiefly a temporary interest. Those upon Scottish law reform are known to have had considerable influence in producing the changes desired. Late in life, he undertook, at the request of Jeffrey's executors, the life of his beloved friend. This work was published in 1852. C. will be best remembered by the *Memorials of his Time*, which appeared posthumously in 1856. It is a kind of autobiography, into which have been interwoven numerous anecdotes illustrating old Scottish life, and numerous sketches of the men who composed the brilliant circle of Edinburgh society at the beginning of the present century. A portion of the manuscript left, remains unpublished, awaiting a date further removed from the times of which it treats.

**CO'CKCHAFER** (*Melolontha vulgaris*), a beetle of the family *Lamellicornes* (q. v.), and section *Phyllophagi* (leaf-eaters), very common in England and most parts of Europe, comparatively rare in Scotland, famous for the ravages which it commits, both in the grub state and in that of a perfect insect—the winged beetle feeding on the leaves of fruit-trees, and of many forest-trees, as the sycamore, lime, beech, and willow; the grub devouring the roots of plants, particularly of pasture-grasses and corn. The C. is fully an inch in length, of a pitchy black colour, with a whitish down, giving a sort of powdered appearance; the sides of the abdomen marked by a range of triangular spots; the abdomen terminating in a point; the antennæ short, terminating in a club formed of six or seven leaflets: the grub is about an inch and a half long, thick, whitish, with a red head and six legs. The C. does not live long after it has passed into its perfect state, but it lives nearly four years in the grub or larva state. The female C. deposits her eggs in the earth. The ravages of cockchafers were so great in some of the provinces of France in 1785, that the government offered a premium for the best mode of destroying them. The whole grass of a field has often been destroyed in a short time by their grubs, and the beetles themselves strip off the foliage of trees like locusts. They have sometimes appeared in prodigious numbers in some places in England; the river Severn is said to have been so filled with their bodies in 1574, that the water-wheels of the mills were clogged; and in 1688, they so abounded in the county of Galway, in Ireland, that they hung in clusters on the trees and hedges like bees swarming; the noise of their countless jaws at work was heard by every traveller, and was compared to that of the sawing of timber. Rooks and other birds render great service by preventing the excessive multiplication of cockchafers.



Cockchafer (*Melolontha vulgaris*):
*a*, full-grown larva; *b*, pupa; *c*, perfect insect.

**CO'CKER**, a small kind of spaniel, very similar to the Blenheim dog, often black. The habits and disposition are similar to those of the spaniel. The small size of the C. fits it for ranging in low and thick coverts, and it is accordingly much employed by sportsmen in pheasant and woodcock shooting; but it must not be allowed to range to any considerable distance, as it cannot be trained to wait for the sportsman, but starts the game.

Cocker.

**CO'CKER, EDWARD**, widely celebrated on account of his *Arithmetic*, which has served as the model of almost all school-treatises subsequent to its publication, was born, it is supposed, in London about the year 1631 or 1632; and died between the years 1671 and 1675. The first edition of his famous *Arithmetic* (which was the first to confine itself to commercial questions only) was published, after his death, in 1677, by John Hawkins, who came into possession of C.'s MSS. C. was author of some other works, but his fame rests entirely on the one mentioned. The expression, 'according to Cocker,' became common through its frequent use on the title-pages of arithmetical treatises following his method.

**CO'CKERMOUTH**, a parliamentary borough in the west of Cumberland, at the confluence of the

Cocker and Derwent, 25 miles south-west of Carlisle. It is delightfully situated in an agricultural district, and has a promenade a mile long along the Derwent. The ruins of a castle, founded in the end of the 11th c., stand on a bold height on the left bank of the Cocker, near its junction with the Derwent. The castle was besieged for a month by the royalists in 1648, and afterwards reduced to ruins by the parliamentarians. Near C. is a tumulus, with a Roman camp and ditch 750 feet in circuit. Many ancient relics have been found near Cockermouth. There are manufactures of linens, woollens, cottons, hats, hosiery, and paper, and in the vicinity, extensive coal-mines. Wordsworth the poet was born here. Pop. 7275. C. returns two members to parliament.

**CO'CK-FIGHTING** is said to have originated with the Athenians. In the earlier part of our history, since the Conquest, we find little mention of it; but it is evident that it existed in the days of Thomas-à-Becket, and until the time of the Commonwealth it flourished, the pit at Whitehall having been erected and patronised by royalty. It was prohibited in 1654; and although there have been other acts passed with the view of putting it down, it still exists under prohibition.

The greatest point considered in choosing cocks, is the breed. Formerly, there were established favourites, and very large sums were given for their chicks. Much art is said to be displayed in the training of cocks, and in trimming and preparing the cock for the combat; the fastening on of the spurs is a matter of considerable experience. Young cocks are called stags; two years is the best age. In fighting a match, a certain number of cocks to be shewn on either side is agreed upon, and the day before the match, the cocks are shewn, weighed to the greatest nicety, and matched according to their weights. Their marks are all also carefully set down, to prevent trickery. The cocks within an ounce of each other in weight are said to '*fall in*,' and are matched. Those which do not fall in, are matched to fight what are called '*byes*.' Those which do fall in, come into the *main*. The main is fought for a stake upon each battle, and so much for the main, or the winner of the most battles in the main; while the byes have nothing to do with the main, and are usually fought for smaller sums. Should the numbers be equal, so that the main cannot be decided, it is usual to separate two or more cocks which are matched to fight, and are of equal or a dead-weight, and to give or take an ounce either way with one of each of the birds which would fall into the byes, so as to make an uneven number.

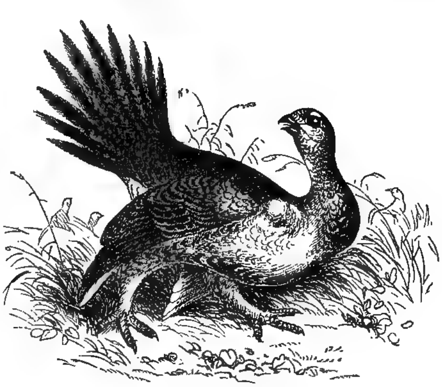
A middling size is considered the best, and from 3 lbs. 6 oz. to 4 lbs. 8 oz. is the medium. Cocks sometimes fight in silver spurs, but more often in steel. The laws of fighting are very precise and particular.

To lend to brutes the means of destroying each other, and of rendering their conflicts more deadly than nature ever intended them to be, cannot be considered a spectacle calculated either to refine or to improve humanity; while the indulging in it as a sport, as it is practised even in its lightest and least objectionable form, is simply cruelty. But the practices of placing a bird, that has perhaps been crippled in combat, down, without even his natural weapons, before a young stag armed, in order that the stag may be taught the art of killing, and the Welsh main, where the cocks fight until only one is left alive, are too disgustingly cruel to be thought of without indignation.

C. is prohibited by 12 and 13 Vict. c. 92. A penalty of £5 may be levied on any person keeping fighting-cocks, letting a cock-pit, or otherwise connecting himself with C., for every day that he shall so act.

**COCK LANE GHOST.** In the year 1762, London was thrown into a state of extraordinary excitement by the reported existence of a ghost in the house of a Mr Parsons, in Cock Lane, Smithfield. Strange and unaccountable noises were heard in the house, and a luminous lady, bearing a strong resemblance to one who, under the name of Mrs Kemt, had once resided in the house, but who had died two years before, was said to have been seen. Dark suspicions as to Mr Kemt having poisoned the lady were immediately aroused, and were confirmed by the ghost, who, on being interrogated, answered, after the fashion of the spirits of our own day, by knocking. Crowds, including Dr Johnson, were attracted to the house to hear the ghost, and the great majority became believers. At length a plan was formed by a few sceptics to ascertain the real origin of the noises. The girl, from whom the sounds were supposed to proceed, was taken to another house by herself, and threatened with the imprisonment of her father in Newgate if she did not renew the rappings that evening, the noises having for some time been discontinued. She was observed to take a board with her into bed, and when the noises took place, no doubt was entertained that they had all along been produced by similar methods. A prosecution was then raised by Mr Kemt, and Parsons was condemned to stand thrice on the pillory for imposture and defamation.

**COCK OF THE PLAINS** (*Tetrao* or *Centrocercus urophasianus*), the largest of the North American species of grouse. It is about one-third smaller than the European Capercailzie (q. v.), or Cock of the Woods. Its plumage is dense and soft, the prevalent colour yellowish-brown, but beautifully mottled and varied with darker tints; the under parts white, with dark streaks and patches. On each side of the neck is a large bare space, capable, when the bird struts, of being inflated into a hemispherical sac. The female is smaller, and of less showy plumage than the male, and is destitute of the neck-sacs. This bird is an inhabitant of the desolate plains on the upper parts of the Columbia, and in the interior of California, living in flocks, and often feeding so much on species of *Artemisia* that its flesh is almost too bitter to be eaten.

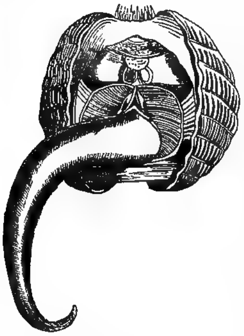

Cock of the Plains.

**COCK OF THE WOODS.** See CAPERCAILZIE.

**CO'CKLE** (*Agrostemma*), a genus of plants of the natural order *Caryophylleæ*, in which the flower has ten stamens and five styles; the five teeth of the leathery naked calyx are much longer than the tube of the corolla, and the capsule is perfectly 1-celled. The common C., or Corn C. (*A. Githago*), is a frequent weed amongst crops of grain, a native of Europe or the west of Asia, but now to be found in almost all parts of the world. It is an annual plant, clothed with very long hair; with large, solitary, terminal lilac flowers. The root, stem, leaves, and seed were formerly used in medicine; the seed is still sometimes sold in Germany under the name of Black Cumin (Schwartzkümmel). The corn C. is a very troublesome weed in some parts of Britain, and is rare and almost unknown in others.

Corn Cockle.

**COCKLE** (*Cardium*), a genus of Lamellibranchiate mollusks, having a shell of two equal ventricose valves, more or less of a heart-shaped appearance. The animal has two *adductor* muscles for drawing the valves closely together; its foot is remarkably large, and bent in the middle, and is capable of being suddenly straightened, so that the animal may move by a jump. More commonly, however, the foot is employed for excavating a hole in the sand or mud, in which the C. burrows; and when used for this purpose, it is distended by being filled with water. Cockles are usually gregarious, and vast numbers are found on sandy and muddy banks. The common C. (*C. edule*) is very abundant on the sandy parts of the British shores, and is one of our most valuable shell-fish, affording much palatable and nutritious human food. The number of known species is about 200; they are most numerous within the tropics, and particularly in the Indian Ocean.—The genus *Cardium* is made the type of a family *Cardiadæ*, and of an order *Cardiaceæ*, which includes *Veneridæ*, *Mactridæ*, *Tellinidæ*, and other families.

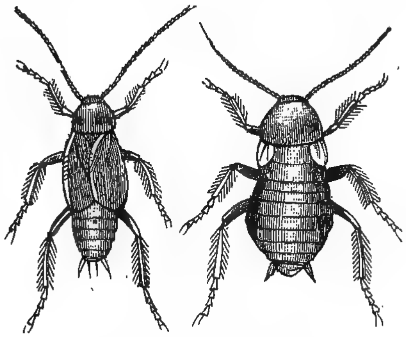


Cockle, with Valves open, shewing the Foot.

**CO'CKNEY.** This word is connected with *cocker* (Dutch, *kokeln*, to pamper; Fr. *coqueliner*, to dandle), which, according to Wedgwood, means primarily to rock the cradle, and hence to cherish, pamper. C. thus meant originally a child delicately nurtured, and was hence applied to the citizens of luxurious towns, as opposed to the hardier inhabitants of the country. The French *Pays de Cocagne*, and similar expressions among other nations, denote a Utopia—an imaginary land of luxurious abundance without labour. London has been famed for its luxury from the earliest times—a veritable Cocagne; and its inhabitants have now appropriated the name of Cockneys.

**CO'CKPIT**, in a ship of war, is a room near the after-hatchway, under the lower gun-deck; it adjoins the surgeon's cabin and the surgery. It contains the medicine-chests for the entire crew, and is the place where wounded men are attended to during an action.

**CO'CKROACH** (*Blatta*), a genus of Orthopterous (q. v.) insects, having an oval or orbicular flattened body, the head hidden beneath the large plate of the prothorax, long thread-like antennæ, and wings folded only longitudinally. The elytra are parchment-like, and the wings are sometimes very imperfectly developed, particularly in the females, as in the case of the common cockroach. The eggs of these insects are collected in a sort of shell fixed to the abdomen of the mother, which at last she deposits in a suitable situation, attaching it by a glutinous secretion. The larvæ, when hatched, discharge a fluid which softens the cement that holds together the toothed edges of a longitudinal slit in this remarkable shell, and emerging through it, at once enter upon active life. They are very similar in form to the perfect insects, and, like them, very voracious. Cockroaches are most numerous in warm countries, and even the common C. (*B. Orientalis*)—now so well known in Britain, a pest in many houses, particularly in towns, and, although not a coleopterous insect, often called the Black Beetle—is said to have been imported from abroad, but its native country is uncertain. It is a nocturnal insect, concealing itself in holes during the day, and fleeing on the approach of a candle. It devours both animal and vegetable substances; and a dark-coloured fluid, which it emits from its mouth, gives a disgusting smell to everything that it passes over. A tame hedgehog is of great use for reducing the numbers of cockroaches in kitchens and other places where they abound. Another excellent method of getting rid of cockroaches, is to place a washing-basin on the floor, with some treacle in the bottom. A piece of wood resting between the floor and the edge of the basin, conducts the C. to the fatal trap, from which the slipperiness of the sides of the basin prevents their exit. In this way thousands of 'black beetles' may be caught in a single night. The common C. is only about an inch long, but some of the tropical ones are much larger, and are more troublesome because of their frequent use of their wings. The Kakerlac, or American C. (*B. Americana*), a native of the warm parts of America, has found its way into Europe, and infests some seaport towns. A small species (*B. Lapponica*) is very common in



Cockroach—Male and Female.

Lapland, sometimes doing great injury by devouring the winter stores of salted fish.

**CO'CKSCOMB** (*Celosia cristata*), an annual plant of the natural order *Amarantaceæ*, a native of the East Indies, one of the most familiar inmates of our hothouses and conservatories, often also planted out in warm borders, especially in the southern parts of Britain. It grows with an upright stem, which becomes flattened upwards, divides, expands, and forms a sort of wavy crest, covered with pointed bracts, and bearing on its surface many very small flowers, so crowded as often to present a rich velvety appearance. The colours are various, and often very brilliant.

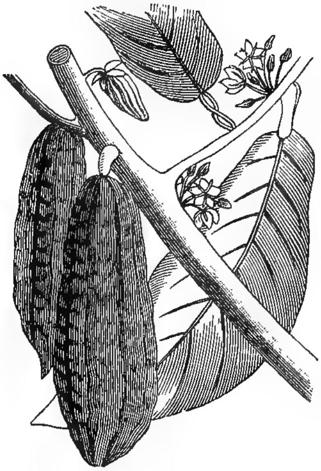
**COCK'S-FOOT GRASS** (*Dactylis*), a genus of Grasses, having the panicle of flowers much on one side of the stem, its secondary branches so short that the spikelets are much crowded into clusters; the glumes unequal, the larger one keeled; each spikelet containing 2—7 florets, each of which has two lanceolate scarcely awned paleæ. This genus is closely allied to Fescue (*Festuca*), but differs in habit. The Common or Rough C. G. (*D. glomerata*), is a native of Europe, Asia, North America, and the North of Africa. It is very abundant in Britain, growing in tufts by waysides, in meadows, woods, &c., from the level of the sea to high altitudes on the mountains. It forms an important part of almost all the best natural pastures, is much relished by cattle, and grows with great rapidity after it has been cut, yielding a large quantity of herbage, and succeeding well on most kinds of soil, and in situations too shady for many other grasses. It is therefore generally sown along with other grasses. An improved variety, of greater size than the ordinary one, has been introduced into cultivation. In America, this grass is called ORCHARD GRASS, and is extensively cultivated. To this genus belongs also the TUSSAC GRASS (q. v.).

**COCK'S-SPUR THORN.** See CRATÆGUS.

**CO'CKSWAIN**, or **COXSWAIN** (pronounced *Cosn*), on board ship, is the steersman of a boat, and commander of the boat's crew. He is expected to have his men always ready for service at short notice, and is furnished with a whistle to summon them.

**CO'COA, CACA'O**, or **CO'CO.** The different kinds of C. either consist of, or are prepared from, the seeds of trees of the genus *Theobrōma.*

The genus *Theobroma* (Gr. food of the gods) belongs to the natural order *Byttneriaceæ*, and contains a number of species, trees of moderate size, with large undivided leaves and clustered flowers, all natives of the tropical parts of America. It is distinguished by a 5-leaved calyx; five petals, concave at the base, and extended into a strap at the apex; the stamens united at the base into a cup, which is divided upwards into ten segments, five tips being without anthers, and the other five, alternate with them, bearing two anthers each; a thread-like style, terminating in a 5-partite stigma; the fruit a 5-angled capsule, of a substance between leathery and woody, not splitting when ripe, 5-celled, and containing many seeds in a pap-like or butter-like pulp. The seeds of several species yield more or less of the C. of commerce. By far the most important species of this genus is *T. Cacao*, to which the name C.-tree is often exclusively appropriated. It is extensively cultivated in tropical America and the West Indies, and its cultivation has been introduced into some parts of Asia and Africa. It generally rises with a bare stem to the height of only 6 or 7 feet, dividing into many branches, and attaining a height of only 16 or 20 feet altogether, although it is sometimes twice that height. The fruit is somewhat like a cucumber in shape, and is 6 or 8 inches long, yellow, and red on the side next the sun; the rind is thick and warty, the pulp sweetish, and not unpleasant; the seeds numerous, compressed, and not unlike almonds, with a thin, pale, reddish-brown, fragile skin or shell, covering a dark-brown, oily, aromatic, bitter kernel, which consists mostly of the wrinkled cotyledons. These seeds are the *C. beans* of commerce; when bruised so as to be reduced to small pieces, after being shelled or decorticated, they become *C. nibs.* The C.-tree produces larger seeds in cultivation than in a wild state. The tree attains its full vigour and productiveness in seven or eight years, and generally yields two principal crops in the year. When gathered, the fruit is subjected to five days' fermentation in earthen vessels or in heaps on the ground, and then opened by the hand, and the seeds dried by the sun or by fire; or it is buried for a while in the earth, till the pulp becomes rotten. The latter method is said to produce the best cocoa (*earthed C.*, or *Cacao terré*).



Theobroma Cacao.

C. is very nutritious. The principal constituent of C. beans is the soft, solid oil called *C. butter*, which forms more than 50 per cent. of the whole shelled bean, about 22 per cent. being starch, gum, mucilage, &c., and 17 per cent. being gluten and albumen. They contain also a crystallisable principle called *Theobromine*, analogous to Caffeine (q. v.), but more nitrogenous.

For dietetic use, C. is prepared in several ways. It is made into Chocolate (q. v.); it is crushed into *C. Nibs*, the purest state in which C. can be purchased in shops; or the unshelled bean is powdered in a hot mortar, or between hot rollers, which yields a paste capable of being mixed with sugar, honey, starch, &c., sold in shops under the name of Soluble C., Rock C., and Common Cocoa.

C. is eaten in the solid state in the form of cakes and bonbons, or is scraped down, and treated with boiling water or milk. When C. nibs are infused with water like coffee, they yield a highly palatable beverage, which is much lighter than any other infusion of cocoa. The large quantity of oily matter present in the bean tends to make the various infusions thick and heavy, so that they do not agree with some delicate stomachs. The annual consumpt of C. is upwards of 100 millions of pounds.

An infusion of the broken and roasted shells of

C.-beans is sometimes used in the same way as tea or coffee. The pulp of the fruit is eaten in the countries in which the tree grows, and a kind of spirit is obtained from it by fermentation and distillation.

**CO'COA-NUT**, or **CO'CO-NUT**, the well-known fruit of a species of palm, *Cocos nucifera*, perhaps originally a native only of the Indian coasts and South Sea Islands, but now diffused over all tropical regions. The C. palm belongs to a genus having pinnate leaves, and male and female flowers on the same tree, the female flowers at the base of each spadix. The genus is further distinguished by a simple 3-celled ovary, which is succeeded by a coarse, fibrous, 1-celled drupe, two of the cells becoming abortive. There are about eighteen known species, all natives of South America, except the most important, the C. palm itself. The American species prefer dry and somewhat elevated districts. The C. palm, on the contrary, is seldom found at any considerable distance from the sea-coast, except where it has been introduced by man, and generally succeeds best in sandy soils near the sea. It is always one of the first of the larger plants to establish itself in the low islands of the Pacific Ocean, so soon as there is soil enough. It has a cylindrical stem, about 2 feet in diameter, and from 60 to 100 feet high, with many rings marking the places of former leaves, and bearing at its summit a crown of from sixteen to twenty leaves, which generally curve downwards, and are from 12 to 20 feet in length. The flowers proceed from within a large pointed spathe; the fruit grows in short racemes, which bear, in favourable situations, from five to fifteen nuts; and ten or twelve of these racemes, in different stages, may be seen at once on a tree, about eighty or one hundred nuts being its ordinary annual produce. The tree bears fruit in from seven to eight years from the time of planting, and continues productive for seventy or eighty years. Of the three round black scars at one end of the shell, the one which alone can be easily pierced with a pin, and through which an opening is commonly made to get out the *milk*, is the destined outlet of the germinating embryo, which is situated there, the kernel consisting generally of the albumen (q. v.) destined for its nourishment. The thick husk is remarkably adapted to the preservation of the seed, whilst the nut is tossed about by the waves, until it reaches some shore far distant from that on which it grew.

Crown of Cocoa-nut Palm, with Fruit.

The C. affords to the inhabitants of many tropical coasts and islands great part of their food; it is not only eaten as it comes from the tree, both ripe and unripe, being filled in a young state with a pleasant milky fluid, but is also prepared in a variety of ways, as in curries, &c.

The kernel of the C. contains more than 70 per cent. of a fixed oil, called C. OIL, or C. BUTTER. The oil is itself an important article of commerce, being much employed in Europe, particularly for the manufacture of *Stearine candles;* and also of a *marine soap*, which forms a lather with sea-water. In tropical countries, and particularly in the East, it is much used as a lamp oil, and as an unguent. It is also employed as an article of food, so long as it remains free from rancidity, to which, however, it is very liable. It is obtained by pressure of the bruised kernel, or by boiling over a slow fire, and skimming off the oil as it floats on the surface. A quart, it is said, may be obtained from seven or eight cocoa-nuts. It is liquid in the ordinary temperatures of tropical countries, but in colder climates, becomes a white, solid, butter-like oil. It becomes liquid about 74° Fahr. It can be separated by compression in the cold into a more liquid portion called *oleïn*, and a more solid part termed *cocostearin*, or *cocosin*, which is of complex constitution, and contains at least six fatty acids. C. oil is not a good lamp oil, as it chars on the wick, and burns with smoky flame. This remark applies also to the *oleïn* obtained from it, which, however, is used mixed with sperm oil, but it lowers the value of the sperm oil. C. oil and resin melted together yield a substance capable of being used with success in filling up the seams of boats and ships, and in tropical countries, for covering the corks of bottles, as a protection from the depredations of the white ants.

The root of the C. palm possesses narcotic properties, and is sometimes chewed instead of the areca-nut.—When the stem is young, its central part is sweet and eatable; but when old, this is a mass of hard fibre.—The terminal bud (*Palm Cabbage*) is esteemed a delicacy, and trees are often cut down for the sake of it.—The saccharine sap (*toddy*) of the C., as of some other palms, is an esteemed beverage in tropical countries, either in the state in which it is obtained from the tree, or after fermentation, which takes place in a few hours; and from the fermented sap (*palm wine*), a spirituous liquor (*arrack*) is obtained by distillation. The juice is often also in the East Indies boiled down to yield sugar (*jaggery*).

The dried leaves of the C. palm are much used for thatch, and for many other purposes, as the making of mats, screens, baskets, &c., by plaiting the leaflets. The midribs of the leaves supply the natives of tropical coasts with oars.—The wood of the lower part of the stem is very hard, takes a beautiful polish, is employed for a great variety of purposes, and is imported into Britain for ornamental joinery, under the name of PORCUPINE WOOD.—The fibrous centre of old stems is made into cordage.—By far the most important fibrous product of the C.-tree is COIR (q. v.), the fibre of the husk of the imperfectly ripened nut. The husk of the ripe nut is used for fuel, and also, when cut across, for polishing furniture, scrubbing floors, &c.

The shell of the C. is made into cups, goblets, ladles, &c., and is often finely polished and elaborately ornamented by carving.—Within the nut there is occasionally found a small stony substance, of a bluish-white colour, 'a sort of vegetable bezoar,' called in India *Calappa*, which is eagerly purchased by the Chinese, who ascribe great virtues to it as a sort of amulet to preserve them from diseases.

*Cocos butyracea*, one of the South American species of this genus, is a very large tree, and its nut abounds in an oil and butter of similar quality to that obtained from the cocoa-nut.—The Double C. of the Seychelles Islands is the fruit of a palm of a different genus. See Lodoicea.

**COCOA-NUT BEETLE** (*Batocera rubus*), a large beetle of the family *Longicornes* (q. v.), tribe *Lamiariæ*, the larvæ of which are very destructive in cocoa-nut plantations, eating their way in all directions in the stems of the younger trees. They are destitute of feet, large and pulpy, and of repulsive aspect; but are esteemed a luxury by the coolies of the East. They resemble the *grugru worms* of South America.

**COCOO'N**, a silken envelope which the larvæ of many insects spin for themselves immediately before their transformation into the pupa state, and which serves for the protection of the inactive and helpless pupa. The name is sometimes extended to coverings formed of other materials, by agglutination or otherwise. Many insects mix foreign materials of various kinds with their silken cocoons; some caterpillars, as those popularly called *woolly bears*, working into them the hairs with which their own bodies were previously covered; and others fastening together the sides of a leaf or of several adjacent leaves. Some of the moths, which attach their silk to leaves, so that the leaf itself forms part of the protective covering of the pupa, proceed with a mathematical nicety as to the position and direction of their threads, more wonderful, if possible, than even that exhibited by bees in the building of their comb. The silken substance of which cocoons are made, is produced much more abundantly by some kinds of larvæ than by others; the cocoons of some being only an open network, whilst others form a compact ball. The C. of the common silk-worm exhibits externally a loose gauze-like covering, within which is a close and compact oval ball; yet all is of one continuous thread, which may be unwound from it 1000 feet long. Different parts of this thread are of different qualities, but the stronger part of it may be unwound as easily as a ball of cotton. The insect works from the outside inwards, and the outer parts of the C. are produced first. The spinnerets by which the C. of the silk-worm and those of other moths are produced, are situated at the mouth of the caterpillar; but the larvæ of a few insects—not lepidopterous—have them at the opposite extremity of the body. The time occupied in spinning the C. is very various in different insects; in the silk-worm, it extends to several days.

**COCY'TUS**, the name given by the ancients to a river of Epirus, fed by the snows of Pindus, and which, after a long underground course, was regarded as falling into the Acherusian Lake.—Cocytus was also the name of a river of the infernal regions, a branch of the Styx.

**COD** (*Gadus Morrhua*, or *Morrhua vulgaris*), a fish of the family *Gadidæ* (q. v.), almost rivalling the herring in its importance to mankind. The genus to which it belongs is distinguished by having three dorsal fins, two anal fins, and a barbule beneath the chin. The C. sometimes attains a weight of 100 lbs.; but even from a small size, it is in request for the market and the table. The roe of the female has been estimated to contain from four to nine millions of eggs, a reproductive power which seems beneficently intended to provide supply for far more extensive fisheries than are yet carried on. The C. is found in all the northern parts of the Atlantic Ocean, and in the arctic seas; it is not known in the Mediterranean. It occurs both on rocky coasts and on sandbanks, where the largest are usually caught in depths of from 25 to 50 fathoms. The productiveness of the great banks of Newfoundland excels that of all others, but the cod-fisheries near the coasts of Sweden, Iceland, and the north of Scotland are also important. The Dutch were engaged in the cod-fishery as early as the middle of the 14th c., and the English resorted for this purpose to the coasts of Iceland about the same period. The French have also engaged largely in the cod-fishery. More than 6000 European vessels are said to be employed in it, besides boats along the shores. The fishery is always carried on by means of lines and hooks, partly by *long-lines* and partly by *hand-lines*. One man has been known to catch from 400 to 550 fish, on the banks of Newfoundland, in ten or eleven hours; and eight men to take eighty-score in a day on the Dogger Bank. The C. is very voracious. Small fishes, shell-fish, &c., are used for bait. The C. is used as food, either fresh, salted, or dried. Great quantities of dried C. are carried from Newfoundland to the West Indies, and are consumed also in the Roman Catholic countries of the south of Europe. *Cod Sounds* are esteemed a delicacy, and are often salted, and so sent to market. They are also used in a dried state as isinglass. The recent discovery of the medicinal value of Cod-liver Oil (q. v.) has added to the economical importance of this fish.

Rock C. and Red C. are names given to the common C. when its colour is somewhat affected by living among weedy rocks.—Baltic C. is a name of the Dorse (q. v.).

**CO'DA**, in Music, is the ending or winding-up of a composition by an extra-melodic phrase, for more completely establishing the final cadence. It may be compared to the peroration of an oratorical discourse.

**CODE** (Lat. *codex* and *caudex*), the primary meaning of the Latin word was the trunk or stem of a tree; latterly, it came to signify more especially wooden tablets bound together, and covered with a coating of wax, which were used for writing on. After parchment and paper were substituted for wood, the name C. was still retained. Cicero applies it to a bill; but it was not till still later, in the times of the emperors, that it was used to express a collection of laws and constitutions.

*Codes, Roman.*—1. *Codex Gregorianus and Hermogenianus.*—The term *codex* never was applied to the laws of the twelve tables, and the earliest collections so called were those of Gregorianus or Gregorius, and Hermogenianus. Of these, whether two separate collections, or two parts of one collection—a disputed point—we have only fragments. They never received the imperial authority, but they were quoted as authoritative compilations in the courts, and they supplied the models on which the subsequent works of Theodosius and Justinian were executed.

2. *Codex Theodosianus.*—This compilation was executed by a commission of eight persons, appointed by Theodosius the Younger in the year 429, and afterwards increased to sixteen. The work was completed and published, or rather promulgated, as law throughout the Eastern Empire in 438, and declared to be a substitute for all the constitutions made since the time of Constantine. In the Western Empire also, having been laid before the senate, it was confirmed as law in the same year by Valentinian III., the son-in-law of Theodosius. Nine years later, the new constitutions (*novellæ constitutiones*), which had been made since the promulgation of the C., were likewise promulgated in the Western Empire. The name of novels (*novellæ*) continued to be given to all the constitutions issued subsequent to the date of the Theodosian C. up to the overthrow of the Western Empire. The C. of

Theodosius has been, in a great measure, preserved. It consists of sixteen books, which are subdivided into titles and sections. The best edition is that of J. Gothofredus (6 vols. fol., Lugd. 1665), which was re-edited by Ritter (Leip. 1736—1745). This edition contains the Theodosian C. entire, except in the first five, and part of the sixth book, for the reproduction of which the Breviary or abridgment prepared by the orders of Alaric II., king of the Visigoths—which itself may be regarded as another C.—formed the only guide. Some recent discoveries of MS. and palimpsests have added considerably, not only to our critical knowledge of the contents of this C., but have enabled us to restore several of the genuine constitutions of the first five books. Of the 262 laws and fragments of laws, which were omitted in the Breviary, 62 have been thus restored (see *Jus Civile Antejustin.*, Berol. 1815).

3. *Codex Justinianeus.*—In 528, the Emperor Justinian appointed a commission of ten persons, one of whom was the celebrated Tribonian (q. v.), to compile a C., incorporating in it the previous codes of Gregorianus, Hermogenianus, and Theodosius, and also the Constitutions (q. v.), Rescripts (q. v.), and Edicts (q. v.), subsequently issued. The work was performed in fourteen months, and it was then declared that the new C. should supersede the older compilations. A second edition of this work, revised, and having subsequent constitutions, &c., incorporated (*Codex Repetitæ Prælectionis*), is what we now know as the C. of Justinian. It consists of twelve books, divided into titles. See CORPUS JURIS.

*Gothic C.*—The laws of the barbarians were all collected into a single C., which bore the title of *Codex Legum Barbarorum.* Of these various systems, the first was that of Alaric, king of the Visigoths, mentioned above, augmented by the legislative labours of his successors. To this C. was given the title of the Gothic law, *par excellence*, and it was the best and fullest of all the barbarian codes. The second C. comprised in the collection was that of the Burgundians; the third, the Salic Law (q. v.), composed when the Franks issued from their German forests; the fourth, the law of the Frisians, which dates from the times of their conquerors, Pepin and Charles Martel. These, and all the other codes by which the tribes of the north which overthrew the Empire were governed, merged at last in the feudal system, and a mass of local customs speedily arose which introduced the greatest uncertainty into jurisprudence.

*French Codes.*—Charles VII. was the first of the kings of France who attempted, by a series of general *ordonnances*, to introduce something like uniformity into the legislation of France; and several of his successors, in particular, Louis XI. and Henry III., entertained the idea of establishing a single C. for the whole kingdom. A C., having this object in view, was subsequently prepared by Michel de Marillac, and published in 1629. It consisted of 471 articles, and is spoken of by French jurisconsults in terms of the highest praise. Its reception, however, was very partial, confined indeed to the jurisdiction of the parliament of Dijon. Louis XIV., who, amongst his other ambitions, affected that of becoming the French Justinian, published a series of very important ordonnances, embracing most of the leading departments of the law. The work was executed by a commission composed of the most distinguished magistrates and advocates of the kingdom, and before the various ordonnances received the royal assent, the king caused them to be discussed with the principal officers of parliament. Minutes of these discussions have been preserved, and they constitute one of the most precious monuments of the history of French jurisprudence. Many important chapters were subsequently added to this C., before it assumed the form in which, as the C. of Louis XV., it represents the condition of French jurisprudence previous to the Revolution.

Such, with the addition of sundry attempts at legislation during the period of anarchy which succeeded, was the position of affairs when Napoleon assembled that brilliant band of jurisconsults—Tronchet, Portalis, Merlin, Bigot-Préameneu, Treilhard, Pensey, &c.—by whose labours, aided in no insignificant degree by that marvellous insight into human affairs which he himself possessed, the modern legislation of France, and of no small portion of the rest of Europe, was called into existence. Such was the energy which he contrived to bring to bear on the work, that the vast edifice of the C. Napoleon, or C. Civil, was reared in a single year, the first title having been promulgated on 5th March 1803, and the last on 30th March 1804. The C. de Procédure Civile followed in 1806, the C. de Commerce in 1807, the C. d'Instruction Criminelle in 1808, and two years afterwards, the C. Pénal. The period of the Restoration produced several codes of less importance—forest-laws, fishing-laws, &c. The C. Napoleon received the force of law in the countries which were successively subjugated by France; in Italy, in the kingdom of Holland, in the Hanseatic departments, in the grand duchy of Berg. In the Rhenish provinces and in Belgium, it still forms the basis of legislation. Several other countries have since codified their legislation, by far the greater number of these codes being modifications of the C. Napoleon adapted to local habits and requirements.

**CO'DICIL**, a supplement to a will, whereby anything omitted is added, or any change demanded by the altered circumstances of the testator or the beneficiaries, is effected. A C. is authenticated in the same manner as a will, and possesses the same privileges when holograph, or written by the hand of the testator himself. See TESTAMENT, WILL.

**CODIFICA'TION**, the act of forming a Code (q. v.), or systematic collection of laws. Though a code, in the wider sense, comprehends frequently the whole legislation of a country, there is a narrower sense in which the term is applied to a particular branch of legislation, such as commercial law, criminal law, marine, &c. In this latter sense, some of our general acts of consolidation, such as the Merchant Shipping Act of 1854 (17 and 18 Vict. c. 104), may almost lay claim to the character of codes. All attempts at C. in the wider sense in England have failed, notwithstanding the earnest advocacy of Lord Brougham. The department in which it seems to be most hopeful is the law-merchant, in which, being necessarily cosmopolitan beyond the other departments of the law, great benefit may be derived from the labours of our continental neighbours. A brief history of C. in France will be found under CODE.

**CO'DLIN**, the name given to a number of varieties of apple, chiefly used for culinary purposes. Some of them are in high repute in Britain, both on account of the quality of the fruit and the productiveness of the tree. The fruit cannot easily, however, be kept long. In most of the varieties which bear this name, it is large and somewhat conical. The trees are often propagated by layers or suckers, or even by slips, plants thus obtained becoming fruitful much sooner than grafted trees.

**CODLIN MOTH** (*Pyralis pomona*), a small moth which is very injurious in apple-orchards in some parts of Britain, laying its eggs in the eyes of the newly formed fruit, within which the larva feeds, so that the growth of the fruit is arrested, and it falls prematurely off. This moth is one of the *Tortricidæ*, agreeably coloured, with rather short and broad wings. The caterpillar has sixteen feet.

**COD-LIVER OIL** is generally obtained from the livers of the common cod (q. v.), but likewise from allied species, as ling, dorse, coal-fish, torsk, &c. In these fish, the adipose tissue (q. v.) containing oil, is almost entirely confined to the liver, in which they agree with the shark tribe, whilst in other fish, as in the herring and salmon, the oil is diffused over the entire structure of the animal. C. O. is prepared largely in Britain, Norway, and Newfoundland. There are three varieties of the oil sold in commerce—*pale C. O.*, *pale-brown C. O.*, and *dark-brown Cod-liver Oil.*

In the preparation of the oil, the livers are placed in a tub with a layer of spruce boughs at the bottom, and subjected to pressure, when the light-coloured or pale oil exudes, and is run off by an opening at the lower part of the tub. As the livers partially putrefy, more oil escapes, which is darker than that procured from the fresh livers, and constitutes the pale-brown oil; whilst the residual livers being boiled with water, part with the remaining oil they contain, and yield the dark-brown oil. The pale oil thus approaches more nearly the condition in which the oil is present in the livers, while the other varieties are more or less impregnated with the products of the putrefaction of the livers. The purer oil has a peculiar fishy odour and taste, which is not disagreeable, although it remains for a little time, and in some cases requires a little practice to get accustomed to it. The darker varieties have more or less of a disagreeable empyreumatic odour and taste, and leave in the throat an unpleasant nauseous sensation, more difficult to overcome.

The oil mainly consists of oleic and margaric acids, in combination with glycerine, and holding in solution the constituents of the bile, acetic acid, a phosphorised oil, as also iodine and bromine. These ingredients are most largely present in the light-coloured oil. C. O. is occasionally adulterated with more or less train-oil, to which a little iodine has been added. In the purer varieties of C. O., the presence of any such admixture can be at once observed from the disgusting odour, although in the darker varieties of C. O. the test of odour cannot be relied on.

As a remedy, C. O. has a great reputation as efficacious in the treatment of scrofulous and tubercular diseases, and especially in Consumption (q. v.); it has also been used extensively in chronic rheumatism, in rickety affections, and in other diseases of the bones and joints. The virtues of C. O. have been ascribed to iodine, bromine, and other specific ingredients; but, on the whole, the most probable view of its action is that it is simply a fattening agent—a fatty food—and that it acts by nourishing the system in cases attended with emaciation, just as new milk, cream, and butter, or fat bacon, will sometimes act in similar cases. C. O. is often found to be more easily digested than, from its somewhat disagreeable odour and taste, might have been expected. Children, in particular, often take it readily; and in emaciated old people, it is sometimes of great service in conjunction with remedies suited to the peculiar character of the case. In true tubercular consumption, it has for some years enjoyed a great reputation; but it is very far from having anything like a specific remedial action in that disease. C. O. is commonly taken in doses of from a dessert-spoonful to a table-spoonful three times a day; but a pint, or even more, is said to have been consumed daily in some instances with good effect, or at least without injury.

**CODO'GNO**, a town of Lombardy, Northern Italy, situated in a rich district between the Adda and the Po, about 15 miles to the south-east of Lodi. It is well built, and has manufactures of silk and linen, and a great trade in cheese. Pop. 9632.

**CO'DRINGTON**, SIR EDWARD, G.C.B., &c., a distinguished British admiral, third son of Edward Codrington, Esq., was born in 1770, and entered the navy in 1783. In 1794 he was lieutenant of the *Queen Charlotte*, Lord Howe's flag-ship, in the actions of the 28th and 29th May and 1st June. At the battle of Trafalgar, in 1805, he was captain of the *Orion*, 74. He afterwards served in the Mediterranean, and in North America, and rose to the rank of vice-admiral in 1821. In November 1, 1826, he was appointed commander-in-chief of the Mediterranean squadron, and in that capacity took the leading part in the battle of Navarino (q. v.). In reward for this victory he received the Grand Cross of the Bath, with Russian and French orders; but the battle being considered an 'untoward event,' as it was characterised by the Duke of Wellington, C. was recalled. He attained the full rank of admiral of the red in 1837, and in 1839 was appointed commander-in-chief at Portsmouth. He was M.P. for Devonport from 1832 to 1839. He died April 28, 1851.—His son, MAJOR-GENERAL SIR WILLIAM JOHN CODRINGTON, was commander-in-chief of the British forces in the Crimea, 1855—1856; and in 1859 was appointed governor of Gibraltar.

**CO'DRUS**, the last king of Athens, was the son of Melanthus, and, according to Grecian legend, sacrificed his life for his country about the year 1068 B.C. A war raging between the Athenians and Dorians, the oracle declared that the victory should belong to those whose king was slain by the enemy; whereupon, C., attiring himself as a peasant, entered the Dorian camp, and having picked a quarrel with some of the soldiers, contrived to have himself slain. His son, Medon, was made Archon (q. v.) for life, on the pretence that no one was worthy to succeed such a man as king. The accounts, however, which have come down to us, indicate that the sons of C. had quarrelled about the succession after their father's death, and it is more probable that the aristocratic families (the Eupatrids) took advantage of the opportunity presented to them, of diminishing the regal authority by abolishing the name.

**COËFFI'CIENT** (Lat. together-making) is the name given in Algebra to the known or constant factor of an unknown or variable quantity. Thus, in the expressions $4x$ (4 times $x$), $bz$ ($b$ times $z$), 4 and $b$ are coefficients of $x$ and $z$, $b$ being supposed known as well as 4, and $x$ and $z$ unknown or variable. Strictly speaking, in a product, such as $3 \times 5$, $4 \times x$, or $b \times z$ ($= bz$), either of the two factors is a C., since they 'together make' the product; but in practice, the meaning is restricted as above explained.

**COEHOORN**, or **COHORN**, MENNO, BARON VAN, called the Dutch Vauban, was born at Lettingastate, near Leeuwarden, in 1641, and studied fortification and mathematics under his uncle Bernardus Fullenius, then professor of these sciences at Franeker. Prince Henry Casimir, Stadtholder of Friesland, apprised of the youth's great abilities, appointed him, in his 16th year, captain of a company of infantry; and in 1674 C. greatly distinguished himself at the siege of Maestricht, and in various battles. At the siege of Grave, in 1674, he demonstrated that small portable mortars might be advantageously employed (see next art.); and also that the combined effect of a certain mass of projectiles is much greater than the effect produced by a successive discharge of the separate projectiles composing the mass. The application of this principle distinguishes the operations of Coehoorn. C. covered himself with honour before Kaiserswerth (June) and Bonn (October 1689), and the Elector of Brandenburg wanted to make him major-general, a promotion he refused. He also distinguished himself in the battle of Fleurus (July 1, 1690). He was now for some time in disgrace, but was soon sought again by William III. He fortified Namur, and defended his own intrenchment 'William' against Vauban in 1692; besieged that fortress in 1695, and retook it; was appointed lieutenant-general and director-in-chief of the Dutch fortifications, and fortified several towns, of which Bergen-op-Zoom may be considered his master-piece. In 1702 he annihilated the French lines near St Donat. He died at the Hague, March 17, 1704. His principal works are, *The New System of Fortification* (Leeuwarden, 1685) and *The Pentagon.*

**COE'HORNS**—named from the military engineer who invented or introduced them—are small howitzers, or mortars, generally 4⅖ inches calibre. These implements of war, being easily moved and adjusted, and taking little powder, are found very useful in sieges, if grouped in great number. A battery of 30 or 40 C., by pouring their small shells or grenades into the outworks of a fortress, may prevent the garrison from effecting a strong occupation, or making a demonstration.

**CŒ'LELMI'NTHA** (Gr. hollow worms), the name given by Owen to one of the two orders of Entozoa (q. v.), or Intestinal Worms, consisting of those which have a distinct abdominal cavity and intestinal canal, the *Vers intestinaux cavitaires* of Cuvier. Examples of this order are *Ascaris, Strongylus,* and *Filaria.*

**CŒ'LE-SY'RIA** (Hollow Syria), now called by the natives El-Bŭkâ'a, 'the deep plain,' a valley of Syria, extending between the ranges of the Lebanon and Anti-Lebanon, at an elevation of about 2300 feet above the sea. Its length is about 70 miles, and its average breadth 7. In this valley stand the ruins of Baalbek and Chalcis.

**CŒ'LIAC A'XIS.** See Aorta.

**CŒ'NOBITES** (Gr. *koinos,* common, and *bios,* life), or **SYNODITES,** the name given to those monks who live together, in contradistinction to the Anchorites (q. v.), or hermits, who withdraw from all society, and live in a solitary fashion. The first *Cœnobium,* or monastery, was founded by Pachomius, a disciple of St Antony, about the year 340 B. C., at Tabennæ, an island in the Nile. In a short time, it reckoned 1300 monks, and stimulated the establishment of numerous other monasteries in Egypt, Syria, and Palestine.

**CŒNU'RUS.** See Cestoid Worms.

**CO'FFEE.** This well-known beverage is an infusion of the roasted albumen of the seeds of the C. tree (*Coffæa Arabica*), a native of Abyssinia and Arabia, but now naturalised in many of the tropical countries colonised by Europeans. There are a number of species of *Coffæa,* but this one only is known to possess valuable properties; the seeds of *C. Mauritiana* prepared in the same way, are bitter and slightly emetic. The genus belongs to the natural order *Cinchonaceæ.* It has a tubular 4—5-cleft corolla, and a succulent fruit containing two cells lined with a cartilaginous membrane, and each containing one seed.

In a wild state, the C. tree is a slender tree of 15—25 feet high, with few branches; in cultivation, it is seldom allowed to become more than 6—10 feet high, and is made to assume a sort of pyramidal form, with horizontal branches almost from the ground. The leaves are evergreen, opposite, very shining, oblong, and leathery; the flowers are small, clustered in the axils of the leaves, and snow-white; the whole appearance of the tree is very pleasing; and the smell of the flowers is delicious. The fruit, when ripe, is of a dark-scarlet colour, and the seeds are semi-elliptic, and of a horny hardness. The seeds are commonly termed *C. Beans,* but this name is not derived from a resemblance to beans, which they have not, but from the Arabic word *bunn.* They are sometimes, but very incorrectly, designated *C. berries.*

The C. tree succeeds only in countries where the average temperature of the year is about 64—70° F. In Peru and Quito, it is acclimatised at an elevation of 6000 feet, where, however, frost never occurs; but as it delights in a moist atmosphere, it nowhere thrives better than in tropical islands. The fruit ripens in the hothouses of Britain, where the C. tree frequently flowers. C. plantations are laid out pretty much in the same way everywhere. In quadrangles, bordered by fruit-trees, the C. trees stand in rows; they are pruned to the same height, and the ground between them is carefully kept clear of weeds. Where the climate is dry, abundant irrigation is necessary, but the supply of water is cut off as the fruit begins to ripen, in order to the improvement of its quality. The tree yields its first crop in the third year; the crop from a full-grown tree may amount to a pound of C. beans. As the C. tree continues flowering for eight months, its fruits are at any time of very unequal ripeness; in the West Indies and Brazil, three gatherings are therefore made annually. The beans are placed on mats or large floors specially adapted for the purpose, where they are dried by the sun's rays, being meanwhile frequently turned.

Coffee:
*a,* a branchlet with leaves, flowers, and fruit; *b,* section of fruit.

They are passed between rollers to remove the dried pulp of the bean, and the membrane which encloses the seeds themselves, and the C. is afterwards freed from impurities by winnowing, and conveyed in bags to the seaports. As equal care is not, however, bestowed upon the preparation of it in all places where it is cultivated, there are great differences in quality and price.—The earlier history of the C. tree is not very clear. It was not known to the Greeks or Romans; but in Abyssinia and Ethiopia it has been used from time immemorial; and in Arabia it was certainly in use in the 15th c., and over the rest of the East in the 16th century. Towards the end of the 17th c., it was carried from Mocha to Batavia by Wieser, a burgomaster of Amsterdam, where it was soon extensively planted, and at last young plants were sent to the botanical garden at Amsterdam, from which the Paris garden obtained a tree. A layer of this was carried out to Martinique in 1720, where it succeeded so well, that in a few years all the West Indies could be supplied with young trees.

The following sorts are particularly distinguished from each other in commerce. *Mocha C.*, which comes from Arabia, and is known by its small gray beans inclining to greenish; *Java* or *East Indian C.*, which has large yellow beans; *Jamaica C.*, with beans somewhat smaller and greenish; *Surinam C.*, which has the largest beans; *Bourbon C.*, with beans pale yellow and almost whitish.

The employment of C. as a beverage was introduced from Arabia, in the 16th c., into Egypt and Constantinople. Leonhard Rauwolf, a German physician, was probably the first to make C. known in Europe, by the account of his travels printed in 1573. Soon after the first introduction of C., COFFEE-HOUSES arose almost everywhere. The first in Europe was established in Constantinople in 1551. In London, the first coffee-house was opened in Newman's Court, Cornhill, in 1652, by a Greek named Pasquet. This Greek was the servant of an English merchant named Edwards, who brought some C. with him from Smyrna, and whose house, when the fact became known, was so thronged with friends and visitors to taste the new beverage, that to relieve himself from annoyance, Edwards established his servant in a coffee-house. The first coffee-house in France was opened at Marseille in 1671, and in 1672 there was one opened in Paris, which soon had several competitors.

In Arabia and the East, C. is not usually prepared as a beverage in the same way as in Europe, except by Europeans. A decoction of the unroasted seeds is there generally drunk; and for the 'Sultan's Coffee,' the pericarp with the dried pulp roasted, is employed.

The great demand for C. has led to the employment of a number of cheaper substitutes, of which *Chicory* (q. v.) root is the best known in this country. Of others, dandelion root, carrot, and the seeds of the common yellow iris may be mentioned. They are prepared by roasting like coffee. The seeds of *Astragalus Bœticus*, already mentioned in the article ASTRAGALUS, are known on the continent of Europe as *Swedish C.*, and are said to be the best substitute for C. yet discovered. But all these substitutes want the most important constituent of true C., *caffeine;* and are therefore very different from it in their qualities. C. is subject to great adulteration, most of the articles specified as substitutes being employed for this purpose. The chief substance of mixture, however, is chicory, the use of which for this purpose was legalised by a Treasury minute in 1840. This adulteration was prohibited by a Treasury minute of 1852; but it being found impossible to make the prohibition effectual, a minute was passed in the succeeding year, permitting the mixture and sale of C. and chicory, on condition that the parcels containing it were labelled in conspicuous letters *Mixture of Coffee and Chicory.*

The leaves of the C. tree are used in the western part of Sumatra instead of the seeds. They are prepared by quick drying in a manner similar to that in which tea-leaves are prepared; and in this state contain even a larger proportion of caffeine than the C. beans of our shops. It seems not improbable that the use of the C. leaf may yet extend very much.

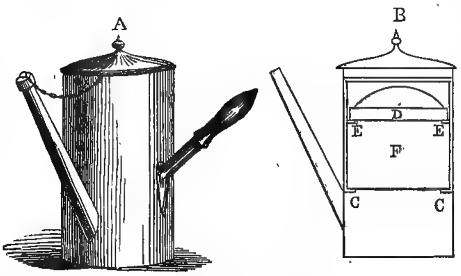
C. owes its exhilarating and refreshing properties to the presence of three substances: 1. *Caffeine* (q. v.), which occurs in the roasted bean to the extent of ¾ to 1 per cent.; 2. A *Volatile oil*, which is not present in the raw bean, but is developed during the process of roasting to the extent of only one part in about 50,000 of the roasted C.; and 3. Astringent acids, resembling tannic acid, but called Caffeo-tannic and Caffeic acids. The average composition of unroasted C. is as follows:

| | |
|---|---|
| Caffeine, | 0·8 |
| Legumin (vegetable caseine), (q. v.), | 13·0 |
| Gum and sugar, | 15·5 |
| Caffeo-tannic and Caffeic acids, | 5·0 |
| Fat and volatile oil, | 13·0 |
| Woody fibre, | 34·0 |
| Ash, | 6·7 |
| Water, | 12·0 |
| | 100·0 |

When the beans are roasted till they assume a reddish-brown colour, they lose 15 per cent. by weight, and gain 30 per cent. in bulk; when further roasted till they become chestnut-brown, they have lost 20 per cent. by weight, and increased 50 per cent. in bulk; whilst if the roasting is continued till the beans become dark-brown, they lose 25 per cent. in weight, and acquire 50 per cent. in bulk. The beans should never be darker than a light-brown colour, which is quite sufficient to bring out the excellent aroma and other qualities of the C.; and when the roasting is carried further, more or less charring is the result, and a disagreeable burned smell is produced, which tends to overcome the natural pleasant aroma.

C. does not retard the action of the bowels, as strong infusions of tea tend to do, partly because there is less of the astringent principle, and also owing to the presence of the aromatic oil which tends to move the bowels. The important offices which C. fulfils are, to allay the sensation of hunger; to produce an exhilarating and refreshing effect; and, most important of all, to diminish the amount of wear and tear, or waste of the animal frame, which proceeds more or less at every moment. See NUTRITION. The grounds of C. are very nutritious, from containing so much legumin; and some of the eastern nations take advantage of this, and use the grounds as well as the infusion. In other respects, C. possesses similar properties to Tea (q. v.).

An endless variety of apparatus have been contrived—some of them of great complexity—for preparing C. for the table. The chief object aimed at is, to obtain the liquor free from all sediment. One of the simplest and cheapest of these contrivances is the percolating C.-pot, represented in the figure. The easiest way of making C.—requiring no special apparatus, and as satisfactory in the result perhaps as any—is to put two ounces of (fresh-roasted and fresh-ground) C. into a small saucepan or common C.-pot; pour over it a pint of boiling water, and allow it to stand, closely covered up, by the side of the fire (but *not* to boil) for five minutes. The liquor may then be simply poured off the grounds, or it may be strained through a cloth, and then returned to the saucepan or C.-pot (previously rinsed out), and warmed again. Soyer recommends, that before the boiling water is poured in, the saucepan should be set dry on the fire, and the powder stirred till it is quite hot, but not in the least burned. In France, a pint of boiling milk is added to a pint of coffee. The chief effect of adding chicory to C. is to deepen the colour.



Percolating Coffee-pot:

A is the coffee-pot with the nozzle fixed; B is a section of the same with the percolator, F, inserted, which easily slips into the coffee-pot, and rests on plugs at C, C; D is a small upper percolator, with a curved handle, which fits into the top of F, also resting on plugs, E, E. When coffee is made in this pot, the percolator, F, is placed in its situation within the pot; all the openings in the percolator are covered gently with coffee; the small upper percolator, D, is put in its place, and boiling-water is poured through it on the coffee, in such quantity as may be wished. The cover and nozzle are immediately fitted on the pot, which is placed on the fire until steam appears at the spout and cover, when it is instantly withdrawn.

Essence of Coffee is a highly concentrated infusion, mixed to the consistence of treacle with extract of chicory and burned sugar, and kept in well-corked bottles. By pouring boiling water upon a tea-spoonful of the essence, a cup of very tolerable C. may be prepared in a moment.

The trade in C. is of great importance. The following statement is given in *M'Culloch's Commercial Dictionary* as 'a pretty fair estimate,' in 1858, of the exports of C. from the principal places where it is produced, and of the annual consumption in those countries into which it is imported from abroad:

Exports.

| | Tons. | |
|---|---|---|
| Mocha, Hodeida, and other Arabian ports, | 8,000 | |
| Java, | 55,000 | |
| Sumatra and other parts of foreign India, | 8,000 | |
| Brazil and the Spanish main, | 160,000 | |
| Hayti, | 16,000 | |
| Cuba and Porto Rico, | 7,000 | |
| British West India colonies, | 2,000 | |
| India and Ceylon, | 38,000 | |
| Dutch West Indies, | 2,000 | |
| French West Indies and the Isle de Bourbon, | 2,500 | |
| | | 298,500 |

Consumption.

| | Tons. | |
|---|---|---|
| Great Britain, | 16,000 | |
| Netherlands and Holland, | 40,000 | |
| Germany, Russia, and countries round the Baltic, | 60,000 | |
| France, Spain, Italy, Turkey in Europe, the Levant, &c., | 55,000 | |
| The United States, | 90,000 | |
| Canada, Australia, &c., | 30,000 | |
| | | 291,000 |

In 1859, the total quantity imported into the United Kingdom was 65,353,029 lbs., or nearly 30,000 tons, of which 51,708,901 lbs. were imported from British possessions, the computed real value being £1,955,543, or about 7½d. per lb. The quantity retained for home consumption during this year was 34,328,526 lbs., on which a duty of 3d. per lb. in the raw state, and 4d. per lb. in a kiln-dried, roasted, or ground condition, was leviable.

**COFFEE BUG** (*Lecanium coffeæ*), an insect of the Coccus (q. v.) family, which lives on the coffee-tree, and is often extremely destructive to coffee-plantations. It has of late years devastated some of these in Ceylon. To check its ravages, the experiment was tried of introducing into the plantations the red ant (*Formica smaragdina*), abundant in many of the gardens and jungles of the island, which feeds greedily on the C. B.; but the fierce assaults of the ants on the naked skins of the Malabar coolies, made them threaten to leave the estates.

**CO'FFEE-TREE, Kentucky.** See Gymnocladus.

**CO'FFER,** in Fortification, is one particular kind of *Caponnière* (q. v.).

**COFFER,** a deep panel in a ceiling, also called a caisson.

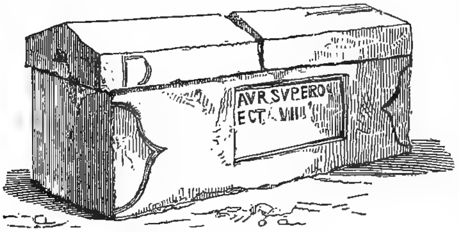
**COFFER,** a casket for keeping jewels or other valuables. Caskets and chests were sometimes made of iron, but more frequently of wood.

**CO'FFERDAM,** a water-tight structure used in engineering for excluding the water from the foundations of bridges, quay-walls, &c., so as to allow of their being built dry. Cofferdams are generally formed of timber piles driven close together (called sheeting) in two or more rows, according to the depth of water and the nature of the bottom; the space between the rows, which may vary from four to ten feet, being spooned out, down to the solid and impervious bottom, and filled up with clay puddle. Sometimes they are made of only one row of piles of the full height, calked above low-water, with a low or dwarf row outside to confine the puddle up to that level, or, where there is no wave or current, with a mere bank of clay thrown against the outside; and occasionally the upper work is formed of horizontal planking, fixed on open main piles, and calked in the joints. When the bottom is rock, so as to prevent piles being driven, and is not much below low-water, cofferdams are occasionally formed of two stone-walls, with a space between filled with clay.

The cofferdams before spoken of are all what are called high-water dams, and exclude the water at all states of the tide. They require to be provided with sluices, to allow of the water, when first to be excluded, getting out during the ebb, and to shut against it during the flood. The remainder of the water, and all leakages, must be got rid of by pumps, generally worked by a steam-engine. For moderately shallow foundations, and more especially where there is a great rise and fall of tide, tidal-dams are often used. These are sometimes made of sheeting piles, but are often boxes formed of planking or of iron, weighted and sunk into the ground by digging inside in the same way that wells are sunk. These dams can only be used for a couple of hours or thereabouts at low-water, and, of course, require to be pumped out every tide. All cofferdams require to be strongly shored within, to prevent their being forced inwards by the pressure of the external water; and the rows of piles require to be strongly bolted together, to overcome the pressure of the clay puddle, which otherwise would burst them.

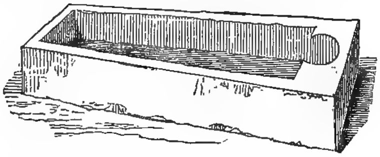
**CO'FFIN** (Lat. *cophinus*, Gr. *kofinos*, in both languages signifying a basket, coffer, or chest, but never a coffin). In the ordinary English sense of the word, a C. is a chest or box in which dead bodies are buried or deposited in vaults; but the term is also applied to a mould of paste for a pie, and in Printing, to the wooden frame which encloses the stone on which the form is imposed. In farriery, it signifies the hollow part of a horse's hoof. It is in the first of these significations alone that we shall consider it here.

It has been keenly disputed amongst scholars, whether it was more usual with the Greeks to bury their dead, or to burn them (see BURIAL); but both customs unquestionably prevailed, and coffins, in the modern sense, were consequently known in Greece. They were called by various names (*soroi, púeloi,* &c.), and composed of various materials, the most common being baked clay, or earthenware. Their forms also varied, sometimes resembling those which we use, sometimes consisting of a narrow triangular box, the undermost side of course being considerably broader than the others. In Rome, the ancient practice was to bury the dead, not to burn them; though under the Empire, and previous to the recognition of Christianity, the latter custom became almost universal. The C. in Rome was called *arca* or *loculus,* and was frequently made of stone, sometimes of a peculiar kind of stone brought from Assos, in Troas, which was said to consume all the body except the teeth in forty days, and which, from this circumstance, was called sarcophagus—an eater of flesh. See SARCOPHAGUS. Many Roman stone-coffins have been found in this country. The simplest of all coffins was that used by the British Celts and other rude nations, consisting of unhewn stones set on their edges, so as to cover the sides and ends of the grave, one or more flat stones being then laid over the body to form a lid. To these succeeded stone-coffins, which were commonly used for persons of the higher classes in Saxon times, and throughout the whole of the middle ages.



Roman Stone-coffin, found at York.

From Bede, however, we learn that the Saxons occasionally employed wood; and the common people, both then and in the subsequent Norman and English eras, were simply wrapped in cloth, and so put into the ground. The same custom seems to have been followed with monks down to a comparatively recent period. Stone-coffins were generally of a single block, commonly tapering from the upper end. In the hollow for the reception of the body, there was generally a part peculiarly fitted for the head, and a hole in the bottom to allow of the juices of the decaying body to escape. These coffins, for the most part, were not buried deeply in the earth, and were frequently placed so near the surface that the lids were visible, which, within a church, often formed part of the pavement. Sometimes they were even above the ground altogether, and thus became the originals of altar-tombs. These lids were often covered with elaborate sculpture, representing crosses and other ornaments. Leaden coffins were occasionally used in the middle ages, as those recently brought to light in the Temple Church in London testify, but the slight wooden cases now in common use appear to be of comparatively recent origin. See Strutt's *Manners and Customs,* and Gough's *Sepulchral Monuments.*



Stone-coffin, Temple Church, London.

**CO'GGESHALL,** a town in the north-east of Essex, on the left bank of the Blackwater, 44 miles north-east of London. It lies partly on low ground, near the river, and partly on some gentle ascents rising from it. There is an endowed grammar-school, founded by Sir Robert Hitcham. The church is one of the finest in Essex, and has been recently restored at great cost. It has manufactures of silk, velvet, and tambour-lace. Pop. 3484. It is supposed to have been the Roman *Canonium,* and the remains of a Roman villa have been found. It has the ruins of a Cistercian abbey, founded by King Stephen in 1142.

**COGNAC,** a town of France, in the department of Charente, with a pleasant situation on an old castle-crowned hill overlooking the river Charente. C. is celebrated as the place where the best brandy in France is manufactured, to which it gives its name. Not half the quantity of so-called *Cognac* brandy, however, is manufactured here. The cultivation of the vine and distillation of brandy form the chief industry of the inhabitants. Francis I. was born here. Pop. 7000.

**CO'GNATE.** See AGNATE.

**COGNI'TION AND SA'SINE,** in Scotland, a form of entering an heir in burgage property. See CONVEYANCING.

**CO'GNIZANCE,** a term used in a loose manner in Heraldry, sometimes to signify a Crest (q. v.), sometimes a Badge (q. v.), or other distinguishing mark.

**COGNOSCE'NTI** (Ital., from Lat. *cognosco,* to know), persons professing a critical knowledge of works of art, and of a somewhat more pretentious character than amateurs.

**COGNO'VIT**—viz., *actionem* (he has confessed the action), in the law of England, is the defendant's written confession that the plaintiff's cause against him is just and true. A C. usually proceeds on the condition that defendant shall be allowed a certain time for the payment of the debt or damages and costs; and it impliedly authorises the plaintiff's attorney to do everything necessary to obtain judgment.

**COHABITA'TION,** in the law of Scotland, means living at bed and board together, like man and wife, and being reputed to be such. These circumstances, when fully established, are held to afford sufficient proof that the contract of marriage between the parties has actually been constituted by their mutual consent.

**CO-HEI'R AND CO-HEI'RESS,** one of two or more persons, among whom an inheritance is divided. See HEIR, SUCCESSION.

**COHE'SION** is the name given to that species of Attraction (q. v.) by which the particles of matter are held together so as to form bodies (see ADHESION), and its measure is the resistance which bodies offer to any mechanical force tending to separate their parts. In gaseous bodies, C. is altogether wanting; their atoms even repel one another. In liquids, notwithstanding the ease with which the particles slide on one another, the operation of C. is distinctly seen in the formation of drops. C. is strongest in solids; and degrees of C., in this case, are much the same thing as degrees of solidity. It is the force of C. that constitutes the strength of materials (q. v.). After the particles of a body have been completely separated, it is found that through C. they will reunite, if pressed sufficiently close together. Two clean, smooth, freshly cut pieces of lead placed together, will cohere so as to require a very considerable force to separate them; and it has not unfrequently happened in plate-glass manufactories, that polished plates of glass have cohered so completely that they have been cut and worked as a single piece.

If the particles of matter had no property in relation to one another, except their mutual impenetrability, the universe, it has been said, would be like a mass of sand, without variety of state or form. As it exists, however, it demonstrates the cross-action of several universal properties of matter. Among those which most affect its state and form, are heat and cohesion. It may be said that bodies assume the solid, liquid, or aëriform states, just according to the proportion that the C. of their particles bears to those forces which, like heat, tend to separate them. See Heat. Upon modifications of the cohesive force, and its relations to other molecular forces, would seem to depend such properties of matter as elasticity, brittleness, ductility, malleability, &c.

**CO'HORT**, in the ancient Roman armies, was a portion of a legion, consisting usually of 600 men. Generally, there were ten cohorts to a Legion (q. v.).

**COHU'NE OIL**, a fixed oil obtained from the kernel of the fruit of *Attalea Cohune*, a palm (see Attalea), abundant in Honduras and the Isthmus of Panama. The oil is said to be of the finest quality, and to burn twice as long as the best cocoa-nut oil. The tree attains a height of only about forty feet, but its leaves are thirty feet long, and each leaflet measures three feet. The sap is drawn off for palm-wine.

**COIF** (Fr. *coiffe*, Ital. *cuffia*, a cap), a covering for the head in general, but more especially for the circular portion on the crown, which the Roman Catholic clergy are in the habit of shaving, and which is thence called the tonsure. The general meaning of the word is preserved in the verb to coif, coiffed, &c., and still more decidedly in the noun *coiffure*, which, so late as Addison's time, was English as well as French. Its special signification is now limited to the caul or cap worn by serjeants-at-law. It is now the only reminiscence of the tonsure amongst lawyers. On attaining the Degrees of the C., or, what is the same thing, becoming a serjeant, a barrister retires from the Inn of Court by which he was called to the bar, and becomes a member of Serjeants' Inn. See Serjeant.

**COIF**, among the armour of the middle ages, was a sort of defensive hood, surmounted by a helmet, sometimes continuous with the hauberk, and sometimes separate.

**COIMBATO'RE**, a city in the Madras presidency, capital of a district of the same name, situated near the left bank of the Noyel, a tributary of the Cauvery from the right, in lat. 11° N., long. 77° 1′ E. It occupies the south declivity of the Neilgherries, 1483 feet above the sea, near the point where those otherwise isolated mountains connect themselves with the Western Ghauts. Almost immediately to the south of the junction of the two chains, the remarkable depression of Palghatcheri traverses the Western Ghauts from east to west, so as to afford a free passage for both the monsoons—the north-east and the south-west—in their respective seasons. C., which contains about 2000 houses, from its proximity to this great gorge, is admirably ventilated during most of the year. This peculiarity, backed by the elevation, tends to promote the salubrity of the place, which, however, is seriously impaired by the brackish character of the wells. In the neighbourhood is a tank, which, even at the close of the dry season, is three miles in length.

**COIMBATORE**, a district in the presidency of Madras, in lat. 10° 14′—12° 19′ N., and long. 76° 36′—78° 16′ E., containing 8280 square miles, and 1,153,862 inhabitants. Lying to the north-east of the state of Cochin, it is almost entirely beyond the Western Ghauts. Besides the capital above described, there are in the district the towns of Palshat and Darrampoor.

**COI'MBRA**, a city of Portugal, capital of the province of Beira, situated on the right bank of the river Mondego, here crossed by a stone bridge, 110 miles north-north-east of Lisbon. Built round a conical hill, rising abruptly from the river, and surrounded by olive-gardens and orange-groves, its appearance from a distance is as beautiful as it is picturesque. Interiorly, however, it is not so attractive, its streets being steep, narrow, and dirty. Great historical interest attaches to C., which appears to have been originally built by the Goths. From them it passed to the Moors, from whom it was finally conquered in 1064, by Fernando the Great, aided by the gallant Cid. On the erection of Portugal into a kingdom, in 1139, C. was made the capital, and continued so about two centuries and a half. Of the public buildings, the most noteworthy are the cathedral, the churches of San Francisco and San Salvador, the convents of Santa Cruz and Santa Clara, and a fine aqueduct of 21 arches, dating from the 16th century. The university of C., the only one in Portugal, was originally established in 1290, but permanently transferred here in 1537. In 1853, it was attended by 970 students, a large number of whom were Brazilians. Attached to the university are museums, an observatory, a botanical garden, and a library of 60,000 volumes. C. has manufactures of linen, woollen, earthenware, and combs. Pop. 15,000.

**COÏ'N**, a town of Andalusia, Spain, about 21 miles west of Malaga. It is pleasantly situated on a declivity, with wide clean streets, and environed with fine public walks and gardens. It has manufactures of linen and woollen, soap, paper, &c., and in the vicinity, marble and jasper are obtained. Pop. 8200.

**COIN, COINING.** See Mint, Numismatics, Money, Currency.

**COÏ'NCIDENCE.** If, when two geometrical figures are laid upon one another, the boundaries of the one fall everywhere exactly upon those of the other, the figures are said to *coincide*. Such figures are considered as identical; and this C. is taken by Euclid as the test of equality, or rather, as the definition of equality. It is not necessary, in geometry, actually to lay the one figure upon the other; if we know the equality of certain parts, we can infer with certainty that the whole figures *would* coincide, if superimposed, and that the other parts are therefore equal too.

**COINING**, in Law. The privilege of C. money being an exclusive prerogative of the crown, the crime of counterfeiting the king's money, as it was called, was declared to be treason, both by the common law of England and by many statutes. In Scotland, there continued to be some differences in regard to this crime, even after the Union had extended the treason laws of England to that kingdom.

The whole of the legislation on this subject was at length repealed, and a general act passed for the whole kingdom (2 Will. IV. c. 34). By this statute it is enacted—1. That any one who shall fabricate a coin in imitation of a current *gold* or *silver* coin—or gild silver, or colour any counterfeit gold or silver coin—or shall alter silver coin with intent to make it pass for gold coin—or copper coin, to make it pass for gold or silver coin, shall be punishable with transportation for life, or for a term not less than seven years, or with imprisonment for a term not exceeding four years. 2. That any one who shall impair, diminish, or lighten gold or silver coin, shall be punishable with transportation for seven years, or imprisonment for three years. 3. That any one who shall buy, sell, receive, pay, or put off counterfeit gold or silver coin for a lower value than its denomination, or shall import counterfeit gold or silver coin, knowing it to be such, shall be punishable with transportation for life, or seven years, or with imprisonment for not more than four years. 4. The uttering (q. v.) of base coin is punishable with imprisonment for a year. 5. By subsequent clauses, the possession of false money, with intent to utter the same; or of instruments for its fabrication; the conveying such instruments out of the Mint without authority; the fabrication of copper coin, and the altering of current coin so as to make it pass for coin of a higher denomination, are declared to be offences all of which are visited with punishments resembling those above mentioned.

In order to bring these offences within the limits of the statute, it is not necessary that the resemblance of the false to the true coin shall be very perfect; but if it be not such as to deceive a person of ordinary observation, the attempt to bring it into circulation is fraud, and not uttering.

**COIR**, or **CO'COA-NUT FI'BRE**, the fibre of the husk of the cocoa-nut, much used for making ropes, mats, &c. The husks are steeped in water, in pits, for six months, or even for a year, and then beaten with a stick till the fibre readily separates. C. is now well known as one of the best materials for cables, on account of its lightness, elasticity, and strength. C. ropes are produced in great quantity in the Laccadive Islands. They are entirely made by the hand—chiefly by women—without the aid of machinery of any kind. The manufacture of cocoa-nut mats is now carried on to a considerable extent in Britain, the husks being imported for that purpose. This manufacture is one of the branches of industry in which children are employed in the industrial or ragged schools, and criminals in prisons.

**COIX.** See Job's Tears.

**COJUTEPE'C**, a town of San Salvador, Central America. It is situated 15 miles to the south of the site of the late city of San Salvador, which, in 1854, was entirely destroyed by an earthquake. C. has a population of 15,000.—At the distance of a few leagues, a lake of the same name measures 12 miles in length by 5 miles in average breadth; and in windy weather it assumes a green hue, often casting on its shores vast quantities of dead fish.

**COKE** is the fuel generally used in locomotive engines, and is obtained by the heating of coal in ovens, or other arrangements where little air is admitted. Caking coal is most suitable for the manufacture of coke. The process is conducted either (1) in heaps or ridges, or (2) in ovens. The coking in heaps is called the Meiler method, and consists in placing the coal in round stacks, or in long ridges, occasionally to the length of 200 feet. During the building of the coal, wooden stakes are driven in, which are afterwards taken out, and lighted coal introduced at numerous places at the same time. As the coal becomes heated, much smoke and vapour are evolved, which mainly consist of tar, water, and coal-gas. Whenever the smoke ceases to be evolved, the process of coking is regarded as concluded, and the mound or ridge of red-hot cinder, or C., is covered over with fine coal-dust, which, excluding the air, extinguishes the combustion. At places where the operation of coking is conducted regularly on the large scale, it is customary to erect brick chimneys or columns, about the height of the proposed mound, and to build the coal round these, placing the larger masses in the centre, the smaller pieces outside, and ultimately covering the whole with fine coal or dross.

A more economical plan of preparing C. is to introduce the coal into fire-brick ovens. The coal is introduced by the top, and being lighted, a little air is admitted by openings in front. Whenever the coal ceases to evolve smoky vapour, every opening is closed, and the oven is allowed to cool down for 12 to 24 hours. A door in front is then opened, and the C. being raked out whilst still hot, water is thrown upon it, to stop the combustion. Small coal may be used if it belongs to the caking kind; and a little water sprinkled over it, causes the caking operation to proceed more completely. The proportion of C. obtained from coal in Great Britain ranges from 54 to 73 per cent., so that in round numbers the better class of coal for this purpose loses a fourth of its weight. At the same time, the coal increases in volume to the extent of about one-fourth.

C. is a hard, brittle, porous solid, with a colour varying from iron-gray to blackish-gray, and more or less of a metallic lustre, and does not soil the fingers. It absorbs moisture from the air, sometimes to the extent of 30 per cent., and contains an amount of ash ranging from ½ up to 15 per cent. It gives off no smoke in burning, is of great value as a fuel, evolving a very large amount of heat, and is used, not only in locomotive and other furnaces, but also in the smelting of metallic ores.

**COKE**, Sir Edward, a distinguished English lawyer and judge, was born at Mileham, in Norfolk, on the 1st of February 1551—1552. Educated at the free grammar-school of Norwich, and at Trinity College, Cambridge, he passed thence to Clifford's Inn, and subsequently to the Inner Temple, to study law, and was called to the bar in April 1578. His great ability, legal learning, and the tact he exhibited in the conduct of his cases, secured him an immense practice on the very threshold of his career. In 1586, he was appointed recorder of Norwich; in 1592, recorder of London, a position he resigned the same year for the solicitor-generalship. In the following year, he was elected member of parliament for the county of Norfolk, and was chosen Speaker of the House of Commons. In 1594, he was made attorney-general, an office he continued to hold until 1606, when he was appointed Chief-justice of the Common Pleas, the duties of which position he discharged in a manner that secured for him a great reputation. Upright and independent, with a high notion of the dignity and importance of his office, he did not, in an age of judicial sycophancy, hesitate to oppose any illegal encroachment by royalty. The court thought to win him over by making him, in 1613, Chief-justice of the King's Bench. But here he proved equally incorrigible, maintaining, among other things, that the king had no power to stay the proceedings in a court of justice, even when his craven-hearted colleagues begged the royal pedant's pardon on their knees for ever having entertained such an opinion. This was too much: C., in a few months (Nov. 1616), was relieved from his chief-justiceship; but in no long time after, the royal favour was in some measure again extended to him. His support of liberal measures in parliament, however, soon brought him into trouble with the court-party, and in 1621—1622, he suffered seven months' imprisonment in the Tower. In the third parliament of Charles I. (1628), C. took an active part in framing the celebrated Bill of Rights, and it was in a great measure owing to his advocacy that the Lords were induced to agree to it. C. died 3d September 1633. He is now best known for his law treatise, *Coke upon Littleton, or the First Institute*, a work which is still the standard one on all questions of constitutional and municipal law in England. His other works are the *Second*, *Third*, and *Fourth Institutes*, *The Complete Copyholder*, and *Reading on Fines;* while his collection of law reports, which made an epoch in the history of law on their appearance, are still of great value for the profession.

**COL** (Fr. *neck*), in Geography, is a depression or pass in a mountain-range. In those parts of the Alps where the French language prevails, the passes are usually named cols—as the Col de Balme, the Col du Géant, &c.

**COL' A'RCO**, in Music, with the bow, in contradistinction to *pizzicato*.

**CO'LA NUT**, or **KOLA NUT**, the seed—not properly a nut—of *Cola acuminata* or *Sterculia acuminata*, a tree of the natural order *Sterculiaceæ*, a native of the tropical parts of the western coast of Africa, and cultivated in other tropical countries. There are two varieties of the tree—one with broad, and the other with narrow leaves. The natives of Guinea value the seeds very highly, believing that to take a portion of one of them before their meals, improves the flavour of whatever they may eat or drink. When sucked or chewed, cola nuts render the flavour even of very putrid water agreeable. They are said to possess properties analogous to Peruvian bark. They are of the size of a pigeon's egg, of a brownish colour, and bitter taste. They are mentioned by almost all travellers in the west of Africa.

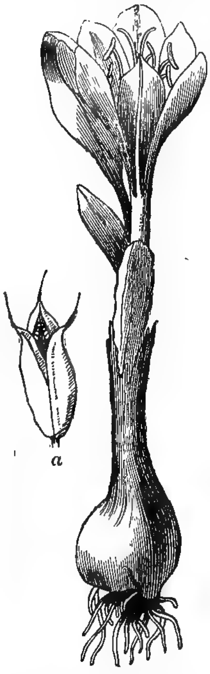
**CO'LBERG**, or **KOLBERG**, a fortified seaport of Prussia, in the province of Pomerania, on the Persante, near its mouth in the Baltic, in lat. 54° 9′ N., long. 15° 34′ E. It stands on a hill, surrounded with swamps, which can be readily laid under water, and is chiefly remarkable for the protracted sieges which it has undergone. In 1102, Duke Boleslaus of Poland besieged it in vain. It endured long sieges in the Thirty Years' War, and in the Seven Years' War, and again in 1807, when it was most gallantly defended against the French. C. has manufactures of woollen, salt, and spirits; and salmon and lamprey fisheries. Pop. about 8000.

**COLBERT**, Jean Baptiste, minister of finance to Louis XIV., was born at Rheims in 1619, and served his apprenticeship in a woollen-draper's shop. He afterwards went to Paris, where his talents introduced him to Mazarin, who soon employed him in most important affairs of state. On his death-bed, Mazarin warmly recommended C. to the king, who, in 1661, appointed him controller-general of finances. C., who found the finances in a ruinous condition, immediately began his reforms. Fouquet, the superintendent under Mazarin, was found guilty of impoverishing the state by his maladministration, and imprisoned for life. C. next instituted a council of finance and a chamber of justice, to call to account the farmers of the state-revenues, who were forced to yield up all the resources of the crown of which they had fraudulently possessed themselves. The debts of the state C. also reduced by arbitrary composition. So complete and thorough was the change which C. effected, that in twenty years the annual revenue had risen to 116 million livres, of which 23 were spent in collection and administration; whereas, when the management of the finances was intrusted to him, the revenue amounted only to 84 million livres, and 52 millions were absorbed in its collection. C. did not rest satisfied with being a monetary reformer, but in various ways developed the industrial activity of the nation by state support. Commerce was extended, roads and canals—including that of Languedoc—were made. He organised anew the colonies in Canada, Martinique, and St Domingo, and founded others at Cayenne and Madagascar. Made minister of marine in 1669, he found France with a few old rotten ships; three years later, she had a fleet of 60 ships of the line, and 40 frigates. C. improved the civil code, introduced a marine code of laws, as well as the so-called *Code Noir* for the colonies; and statistical tables of the population were first made out by his orders. While attending to material interests, he did not neglect the arts and sciences; all men of learning and genius found in C. a generous patron. The Academies of Inscriptions, Science, and Architecture were founded by him. In short, C. was the patron of industry, commerce, art, science, and literature—the founder of a new epoch in France. Notwithstanding the ingenuity of C., the unbounded extravagance of his master led him to raise money in ways objectionable to his reason, and to maintain war-taxes in time of peace. He died 6th September 1683, bitterly disappointed, because his great services were but ill appreciated by the king. The people, enraged at the oppressive taxes, would have torn C.'s dead body in pieces, but for the intervention of the military, and his burial by night. Because he had brains without birth, he was vexed and persecuted, both in private and public life, by those who, having birth, lacked brains.

**CO'LCHESTER**, a parliamentary and municipal burgh and river port, in the north-east of Essex, on the south bank of the Colne, 12 miles from the sea, and 51 miles north-east of London. It stands on the sides and top of an eminence, and is well built. It has a quay for vessels of 150 tons at the suburb called Hythe. Its former manufacture of baize has been superseded by that of silk, which is also on the decline. It has an important oyster-fishery. Pop. 19,443. It returns two members to parliament. In 1859, 978 vessels of 59,044 tons entered and cleared the port. C. is the British *Camulodunum* and the Roman *Colonia*. The town-walls, castle, and many churches and other buildings, consist of Roman brick. Great quantities of Roman remains have been found here, bushels of coins of many emperors, vases, urns, lamps, rings, bracelets, pavements, pateræ. C. was ravaged by the plague in 1348, 1360, and 1665. The ruins of the castle, built of cement-stone and Roman brick soon after the Conquest, have walls 11 to 30 feet thick. There are the ruins of an abbey, founded by Eudo the 'Dapifer,' and the remains of a priory.

**COLCHESTER**, Charles Abbot, Lord, a distinguished legal and administrative reformer, was born at Abingdon, Berkshire, October 1757. He was educated at Westminster School, and Christ's Church College, Oxford, and afterwards studied for the bar. Returned to parliament in 1795, he in the very next year succeeded in effecting an improvement in the legislation regarding temporary and expiring laws; and it is due to his exertions that municipal bodies receive a copy of all new acts as soon as they are printed. The country is mainly indebted to him for the royal record commission, the proceedings of which he for many years superintended. But the greatest service he rendered the country was in obtaining an act for taking the census of the population, the first enumeration under public authority in modern times. It was on his suggestion, too, that the Private Bill Office, which has done much to facilitate parliamentary business, was established. In 1802, he was elected Speaker of the House of Commons, the duties of which high and honourable office he continued to discharge with as much impartiality as distinction, until May 1817, when ill health compelled him to resign. He was then elevated to the peerage as Baron Colchester, with a pension of £4000 a year. He died May 29, 1829.

**CO'LCHICUM**, a genus of plants of the natural order *Melanthaceæ*. The species, which are few in number, are stemless, with flowers half subterranean like the crocus, the limb of the perianth and part of tube only rising above ground. The flowers much resemble crocus-flowers, but are readily distinguished by having six instead of three stamens, and three styles instead of one. The seed-vessel does not remain to ripen underground, as in the crocus, but after the flowering is over, rises in the form of three little follicles slightly adhering to each other, on a lengthened stalk. The only British species is *C. autumnale*, the Meadow Saffron, sometimes also, but incorrectly named *Autumn Crocus*, which is plentiful in meadows and pastures in some parts of England, and of the continent of Europe. It scarcely occurs as a native plant in Scotland. The flowers are pale purple; they appear in autumn, unaccompanied by any leaves; the leaves, which are large and broadly lanceolate, appear in spring, when the stalk which bears the ripening fruit arises amongst them. The whole plant is very acrid and poisonous, chiefly owing to the presence of an alkaloid called *Colchicine* or *Colchicia*. Cattle are not unfrequently injured by it in pastures where it abounds. It is, however, not difficult to extirpate, the repeated pulling of it by the hand, as it appears above ground, being sufficient for this purpose; the roots soon become exhausted, and die. It is a valuable medicinal plant, and is much administered, in small doses, to allay the pain of gout and rheumatism. Repeated doses produce vomiting, purging, increase of the urinary secretion, and profuse perspiration. C. is generally supposed to have been the basis of the *Eau medicinale*, long a celebrated empiric remedy for gout. The parts chiefly used for medicinal purposes are the corm (popularly called the root) and the seeds. The seeds are round, brown, rather larger than mustard-seed; and fatal accidents have occurred from their poisonous nature.—Other species of C. appear to possess similar properties. The *hermodactyls* of the druggists' shops, which for many centuries have enjoyed an extensive celebrity for soothing pains in the joints, and are brought from the Levant, are believed to be the corms either of *C. variegatum* or *C. bulbocodioides;* the former of which is probably the C. of the ancients.—*C. autumnale* is not unfrequent in flower-borders, particularly a variety with double flowers.



Meadow Saffron (*C. autumnale*):
*a*, capsule.

**CO'LCHIS**, a province of ancient Asia, on the east coast of the Pontus Euxinus or Black Sea, situated north of Armenia, and south of the Caucasus. It now forms the Russian province of Imerethia, with the districts of Mingrelia and Guria. It was celebrated in the very earliest times as the native country of Medea (q. v.), and the goal of the Argonauts (q. v.), and was afterwards better known to the Greeks as the seat of some colonies of the Milesians. It was noted for its wine and fruits. The Colchians, according to Herodotus, were of Egyptian descent, being relics of the army of Sesostris, which he attempts to prove by various arguments. In the time of this historian they were subject to Persia; subsequently, they threw off their allegiance, and were ruled by kings of their own; the country then came under the dominion of Mithridates, king of Pontus; afterwards, there were princes of Colchis dependent on the Romans. The principal town was Dioscurias (called under the Romans Sebastopolis), and now Isgaur; the principal river the Phasis.

**COLD** is the term by which we signify a relative want of sensible heat. There are, therefore, no determinate boundaries between cold and heat, and it is a mere arbitrary distinction to call the degrees of the thermometer below the freezing-point, degrees of cold. When the atmosphere, or any substance which comes in contact with our body, contains less heat than the body, it absorbs heat from the body, and we call it cold. See Heat.

The physiological action of C. on the animal organism requires a brief notice. All animals (the warm-blooded animals) to the greatest extent have a certain power of maintaining the heat of the body, in defiance of external cold, as has been shewn in the article Animal Heat. This power is mainly due to a process analogous to combustion, in which carbon and hydrogen taken into the system in food, are made to unite with oxygen derived from the air by respiration. If the combustible materials are not duly furnished, or if the supply of oxygen be deficient (as in various diseased conditions), there must be a depression of temperature. Now, if the temperature of a bird or mammal (except in the case of hybernating animals) be lowered about 30° below its normal standard (which in birds ranges from 108° to 112°, and in mammals from 98° to 102°), the death of the animal is the result. The symptoms indicating that an animal or a man is suffering from a depression of the temperature of the body, are, retardation of the circulation of the blood, causing lividity of the skin, which is followed by pallor, in consequence of the blood being almost entirely driven from the surface, through the contraction of the vessels; a peculiar torpor of the muscular and nervous systems at the same time manifests itself in an indisposition to make any effort or exertion, and in intense sleepiness. The respiratory movements become slower, for physiological reasons, which will be explained in the article Respiration, and the loss of heat goes on, therefore, with increasing rapidity, till the fatal limit is reached, and death supervenes.

In hybernating animals (the marmot, dormouse, bat, &c.), the power of generating heat within their own bodies is very slight, their temperature following that of the external air, so that it may be brought down nearly to the freezing-point. At this low temperature, the vital actions are scarcely perceptible, but when the temperature is again raised, the vital activity returns. The respirations (in marmots) fall from 500 to 14 in the hour, and are performed without any apparent movement of the walls of the chest; the pulse sinks from 150 to 15 beats in the minute; and the animals can with difficulty be aroused from their torpor.—For additional matter bearing upon this subject, see the articles HYBERNATION, INANITION, and DORMANT VITALITY.

C. is one of the most powerful depressing agents, and is a fruitful cause of disease, and even of death. Thus, it is observed, that whenever the temperature of the atmosphere is suddenly reduced, and particularly when it is reduced below the freezing-point, a considerable addition takes place to the mortality of the country at large. The effects of C. are, in ordinary circumstances, most apparent among the aged and the very young, and among those suffering from chronic disease; but when a very low temperature is long continued, even the healthy are sure to suffer, when impoverished so as not to have sufficient means of external warmth in their homes. The most direct effects of C. are in the production of what is commonly called frost-bite. The part so affected is deprived of circulation, and does not bleed on being wounded; it is marble-white or livid, and has lost all sensibility; and if the exposure is continued, or reaction is brought about too rapidly, it is apt to pass into gangrene. The extremities, especially the fingers and toes, and the tip of the nose, are the parts most liable to frost-bite. The remedy is exceedingly gradual restoration of the temperature, with gentle friction. In Russia, friction with snow is commonly resorted to, so as to secure against too rapid reaction. The effects of C. upon the general system are described by arctic voyagers, and a medical detail of them may be found in Baron Larrey's interesting account of Napoleon's disastrous campaign in Russia. The circulation is much depressed; diarrhœa and rheumatic pains are frequent; in the end, the general sensibility becomes impaired, and an irresistible tendency to lie down is experienced, with excessive drowsiness. If this be not resisted, death is certain. The disease commonly termed 'a cold' has been already described under CATARRH.

**COLD CREAM** is the term applied to a preparation of fatty substances, which is used as a mild and cooling dressing for the skin. It may be prepared by heating gently four parts of olive-oil, and one part of white wax, till a uniform liquid mass is obtained, when a little colour and scent may be added; the mixture is then allowed to cool, but must be stirred the whole time, so as to prevent the concretion and consequent separation of the wax. Another variety is prepared with the addition of hogs' lard, but the latter sometimes contains common salt, and is liable to become more or less rancid. C. C. softens the skin, and tends to promote the healing of wounds and of chapped hands.

**COLD PIT**, or **COLD FRAME**, in Gardening, is a simple contrivance for the preservation of half-hardy plants throughout winter, and consists of a pit, seldom more than three feet in depth, and often not so much, walled or unwalled, and covered with a frame, either thatched or glazed.

**CO'LDSTREAM**, a border town in the south of Berwickshire, on the left bank of the Tweed, 15 miles south-west of Berwick, and on one of the main routes from Scotland to England. It is irregularly built on a high site. Pop. 2238. Near C. is the famous ford of the Tweed, where the Scotch and English crossed in former times, before the erection of Berwick Bridge. By this ford Edward I. entered Scotland in 1296, and near it he met the Scottish nobles, to settle the dispute of Bruce and Baliol about the crown of Scotland. By this ford also the Scottish army entered England in 1640. Here General Monk, 1659—1660, raised the regiment still known as the Coldstream Guards (q. v.). Being a border town, C., like Gretna Green, was formerly celebrated for its clandestine marriages.

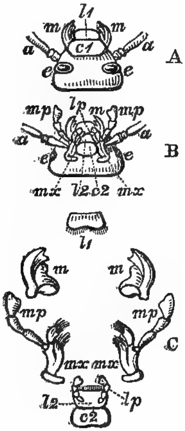
**CO'LDSTREAM GUARDS**, a regiment in the Foot Guards (q. v.) or Household Brigade, is the oldest corps in the British army except the 1st. Foot. General Monk, in 1660, raised a corps at Coldstream, which was at first called 'Monk's Regiment;' but when parliament consented to give a brigade of guards to Charles II., this corps, under the name of C. G., was included in it.

**CO'LEBROOKE**, HENRY THOMAS, an eminent Orientalist, was born in 1765. He early went out to India, where, having served in various civil capacities under the East India Company, he was appointed Sanscrit professor in the newly founded college at Fort-William. Afterwards he became a judge at Mirzapore, and subsequently held the appointment of President of the Board of Revenue. During his residence in India, he had gained an extensive knowledge of the literature of the Vedas and their commentators, as well as of the writings of ancient Hindu grammarians, metaphysicians, and mathematicians. A sound critical judgment marks all his writings. He was a director of the Bengal Asiatic Society; and many of the most valuable essays in the *Asiatic Researches* were contributed by him. These, with other papers, were afterwards republished as *Miscellaneous Essays*, in 2 vols., 1837. He also made translations from the Sanscrit works on Hindu law, algebra, arithmetic, and mensuration, which were important contributions to the history of mathematics. Among his other publications, were a dictionary and a grammar of the Sanscrit language, and treatises on the philosophy and on the sacred Books of the Hindus. He died in London (where he had for some years been president of the Asiatic Society), March 10, 1837.

**COLEO'PTERA**, or **COLEO'PTEROUS INSECTS** (Gr. *koleos*, a sheath; and *pteron*, a wing), an order of insects which, with a little change of limits and characters, has been recognised since the days of Aristotle. The number of species enumerated by naturalists, and of which examples are gathered in museums, amounts to many thousands. The C. are sometimes collectively called *beetles*, although that name is generally more limited in its application, and many of them are known by other names, as weevils, lady-bugs, &c. The glowworm and the blistering-fly (*cantharis*) belong to this order.

The C. may be described as four-winged insects, which have the first pair of wings converted into crustaceous wing-cases (*elytra*), and the second pair of wings folded crosswise under these when not in use. In some of them, the membranaceous wings are wanting, or rudimentary, in one or in both sexes, for there is often a difference of the sexes in this respect: more rarely, the elytra also are wanting in one sex, as in the female glowworm.

The head and antennæ vary extremely in different C., the antennæ often differ considerably in the male and female of the same species. The first segment of the thorax (*prothorax*) is greatly larger than the other two. The abdomen is united to the thorax by its whole width, and not by a stalk. C. have two composite eyes, and no additional simple or stemmatic eyes (*ocelli*). The mouth is fitted for cutting, gnawing, tearing, or chewing, but never at all for suction, and exhibits in the greatest perfection of development the complicated structure which belongs to the mouth of all the *masticating* or *mandibulated* insects. See INSECTS. The annexed cut exhibits the parts of the mouth of a bettle. A, the upper side; B, the under side; C, the parts separated; *a*, *a*, antennæ; *e*, *e*, eyes; *l*1, upper lip (*labrum*); *l*2, under lip (*labium*); *m*, upper jaws (*mandibles*); *mx*, lower jaws (*maxillæ*); *mp*, maxillary palpi; *lp*, labial palpi; *c*, chin (*mentum*). The upper jaws or *mandibles* are hard and horny in most of the C., but comparatively soft in those which feed on vegetable juices, or on putrescent animal matter. The food of the C. is very various: some prey on other insects, worms, &c.; some feed on carrion; some on rotten wood—some on wood in a fresh and growing state—some on the roots of grasses and other plants—some on grain—some on leaves—some on flowers, &c. The food of their larvæ is equally various; but perfect insects and larvæ generally agree in being very voracious. Their digestive organs exhibit great diversities, according to the kinds of their food. The C. are among the insects which undergo complete transformations, and of which the pupa is inactive. The larva (grub) is generally like a short thick worm, with a scaly head and mouth, generally with six legs, of which, however, some species are destitute. Coleopterous insects are distributed over all parts of the world, but are most abundant within the tropics, where also they attain their greatest size and greatest brilliancy of colours. The splendour of the metallic tints exhibited by many of the tropical species is not excelled in nature. The order, however, contains also many species of dull hue, and sufficiently unattractive appearance. Many of the C. are noted for the mischief which they do to crops, stores of provisions, timber and articles of furniture, trees, &c.; few of them are of any immediate use to man, the principal of these being the blistering-flies or cantharides.



**COLERAI'NE**, a parliamentary and municipal burgh and seaport, in the county of Londonderry, Ireland. It is situated chiefly on the right bank of the Bann, four miles from the sea, and 47 miles north-north-west of Belfast, and is the second town of importance in the county. It is generally well built, and consists of a central square called the Diamond, and several diverging streets. C. has manufactures of fine linens, which have long been celebrated as 'Coleraines,' leather, paper, soap, and a large salmon and eel fishery. Vessels of 200 tons can pass up to the town, but the greater part of the trade is carried on from Port Rush, on the coast near the mouth of the river. In 1859, the number of vessels clearing inwards and outwards was 454, with an aggregate burden of 64,372 tons. Pop. 5920. C. returns one member to parliament.

**CO'LERIDGE**, SAMUEL TAYLOR, was born at Ottery St Mary, in the county of Devon, of which parish his father was vicar, on the 21st October 1772. He was educated at Christ's Hospital, and numbered Charles Lamb among his school-fellows. His acquirements in Greek were extensive; and before his 15th year he plunged boldly into the sea of metaphysics, and swam therein until the day of his death. His industry, if desultory, was great; he read whole libraries. Full of book-knowledge, and without ambition or any practical bent, he was on the point of apprenticing himself to a shoemaker, when his head-master interfered, and rescued to literature and thought his most distinguished scholar. A copy of Mr Bowles's sonnets falling into his hands at this time, attracted him towards poetry, in which for a time he found rest.

In 1791, C. entered Jesus College, Cambridge. At the university, he displayed no mathematical aptitude; his whole mind was given to classics, and he obtained a prize for a Greek ode. He did not take a degree. During the second year of his residence at the university, in a fit of despondency, occasioned by an unsuccessful love matter, he quitted Cambridge for London, and enlisted in the 15th Dragoons, under the assumed name of Comberbach. He never advanced beyond the awkward squad, and he enjoyed to the close the reputation of being the worst rider in the corps. One of the officers luckily discovered his classical acquirements, and, becoming acquainted with his real history, communicated with his friends, and C. effected his discharge.

On his release, the poet proceeded to Bristol, and making the acquaintance of certain poetic enthusiasts—Southey was of the number—whose minds were somewhat unsettled by the revolutionary movement in France, he formed a scheme to emigrate to the banks of the Susquehanna, in North America, and there, in pastoral peace and plenty, to bring back the golden age to man. C. found, to his surprise, that before Paradise could be thus regained, money was indispensable; and as of *that* both he and his friends were absolutely devoid, the dream of 'Pantisocracy' had to be given up. About this time, Joseph Cottle, bookseller in Bristol, paid C. thirty guineas for a volume of poems, and after many delays and the advancement of additional sums, the volume was published. In 1795, he married Miss Fricker—his friend Southey on the same day wedding another sister—and removed to Nether Stowey, a village in Somersetshire, in which neighbourhood Wordsworth was then staying. It was here, surrounded with beautiful scenery, and in daily communication with the graver and intenser spirit of his friend, that C.'s principal poems were composed. Here he wrote the *Ancient Mariner*, and the first part of *Christabel*, the music of which took captive Scott and Byron, and which was imitated by both with no remarkable success. At this time, C. was in theology a Unitarian, and preached frequently to congregations of that religious sect. In 1798, he visited Germany, and studied at Göttingen. On his return to England, he went to reside at the Lakes, where Wordsworth and Southey then lived; and then it was that the nickname 'Lake poets' was applied by the opposition Reviews to the trio of friends—a nickname which has long since ceased to be a reproach. In the year in which C. went to live in Cumberland, he published his noble translation of Schiller's *Wallenstein*. Having formed a connection with the *Morning Post*, he contributed to its columns articles on politics and literature. In 1804, he was at Malta, acting as secretary to the governor, Sir Alexander Ball, an appointment he held nearly a year and a half. In 1808, he delivered lectures on Poetry and the Fine Arts at the Royal Institution, London; and the year after, he commenced the publication of *The Friend*, a serial which did not find much commercial success. By this time, C. had written, if he had not published, his finest poems; and imprudent, without resolution, or strong sense of duty, and with a taste for German metaphysics and opium gradually taking possession of him, he left his wife and family with Southey, and went to London, where he resided first with Mr Basil Montague, and afterwards, and up till the period of his death, with Mr Gillman at Highgate. Here the rays of his splendid genius shone more and more fitfully through clouds of German metaphysics, and his mental and moral fibre became more and more debilitated by opium. He meditated many theological and philosophical works, which were to 'reduce all knowledge into harmony,' and many epic poems which were to be the glory of literature, and never progressed so far as the first sentence of either. With the subsidence of the writing faculty, the talking faculty developed itself in C. after a fashion unknown to ancient or modern times. At Mr Gillman's house, he held weekly *conversazioni*, discoursing on every subject human and divine for hours; and thither, from all parts of the country, ardent young men came rushing to listen to the wisdom of the sage, in 'linked sweetness' exceedingly 'long drawn out.' Towards the close of his life, his religious opinions underwent a change, and he became a believer in the Trinity. All intellectual pride had ceased, and the most childlike humility had taken its place. He seemed to be conscious that the greatest powers which for generations had been granted to any Englishman had been by him miserably wasted. He died at Highgate on the 25th July 1834, in his 62d year.

As an intellectual power, C. manifested himself in a great variety of ways. Compared with his contemporaries, he did not produce a very large amount of original poetry; and of what he did produce, a considerable portion is prosaic and artificial, but the residue is of the highest order of merit. No poet ever evolved such exquisite fantasies, or wove our language into such webs of spiritual melody. He is also to this day the greatest of philosophical critics. He was the first who gave a definite reason for the 'faith that is in us' regarding Shakspeare. He was the first representative of German literature and philosophy in England, and, till Carlyle came, the most potent. His own philosophical and theological writings, although, from constitutional indolence and irresolution, in some measure incomplete, are full of incidental merits, and have given a new impulse to English thought; yet it is right to mention here, that in his philosophical writings he has been convicted of the most extraordinary plagiarism. Professor Ferrier, in *Blackwood's Magazine*, April 1840, 'tracked the footsteps of this literary reaver through the Hercynian brakes' of Schelling's metaphysics (see also Hamilton's Reid, note), and has shewn page after page to be pilfered from the German author. It has been argued, however, by way of explanation and palliation, that C., who certainly did not lack original and penetrating powers as a metaphysician, was, from the sluggishness and irresolution of his mind, better fitted to conceive in outline, and then adapt from others in detail, than to elaborate for himself a system of thought, or even the fragment of a system; while his notoriously confused and dreamy memory would be apt to mingle and confound what was his own with what *might have been* such. As a thinker, C. exerted greater influence through conversation than through printed books; and to him we are largely indebted for what of excellence the young men who listened to him at Highgate, the Sterlings, the Hares, the Maurices, and many others have since produced.

**COLERIDGE, Hartley**, the eldest son of Samuel Taylor Coleridge, was born at Clevedon, near Bristol, on the 19th September 1796. In 1815, C. was entered a scholar of Merton College, Oxford. At the university, he became the slave of intemperate habits, and after obtaining the Oriel Fellowship in 1818, he was judged to have forfeited it by the authorities. He then went to London, wrote for the *London Magazine*, and published therein some sonnets of remarkable beauty. He afterwards repaired to Ambleside, to receive pupils, but the scheme failed. Near this little town, so associated with genius, he resided till his death in 1849. He inherited much of his father's genius, and all his weakness of will. He wrote good verses and better prose. As a writer of verse, he is best known by his sonnets, some of which are surpassed only by those of Milton and Wordsworth. His most important prose works are the *Worthies of Yorkshire and Lancashire*, and the *Life of Massinger*.

**COLEROO'N**, the largest and most northerly branch from the Cauvery, flows, after a course of 93 miles, into the Bay of Bengal between Trichinopoly on the north and Tanjore on the south, separating these two districts throughout its last 80 miles. This river is remarkable for two specimens of what is called an *anakatt*, being something of the nature of a weir or dam. For many years, the bed of the C. had been observed to be gradually deepening, while that of the Cauvery, below the point of divergence, was proportionally rising, so as constantly to lessen the supplies for the irrigation of Tanjore. In 1836, however, two anakatts, an upper and a lower, were constructed, to prevent the C. from being further deepened, and to throw more water into the Cauvery—works which were soon found to act so powerfully as to require the balance of an anakatt across the Cauvery itself.

**CO'LESEED.** See Rape.

**CO'LEWORT**, a name given to some of the many cultivated varieties of *Brassica oleracea* (see Brassica), and applied, like the names Borecole and Kale, to varieties differing from the Cabbage (q. v.) in their open heads of leaves, which are used as greens, especially in the winter-months. The same name is also given to cabbages cut for use before their leaves have fully closed into heads; and the common kinds of cabbage are often planted pretty closely together, in order to be used in this way, for a supply of greens in winter and spring. C., or *collet*, is said to have been originally a name of the wild plant from which all the cultivated varieties are derived.

**COLIBRI.** See Humming-bird.

**CO'LIC** (from *colon*—see Alimentary Canal), a name employed by the later Greek and the Roman physicians to denote diseases attended with severe pain and flatulent distension of the abdomen, without diarrhœa or looseness of the bowels. The disease (commonly called *gripes* or *belly-ache*) is now generally believed to be spasmodic in character, and to be dependent upon irregular contractions of the muscular coat of the intestines: its supposed particular connection with the colon, or large intestine, however, is not usually to be made out from the symptoms. Painful disorders of the bowels are very frequent in persons who are not attentive to the regular evacuations, especially when they are exposed to cold so as to experience chill or coldness of the feet, which will often suffice to bring on an attack of colic. The disease is usually attended with constipation (q. v.), and ceases when the regular action of the bowels is restored, although often in this case the operation of medicine is attended by continued pain for a time. Warm fomentations to the abdomen may be employed with advantage, sometimes medicated with opium, or decoction of poppy-heads; and great relief is commonly experienced from friction with a warm liniment, such as opodeldoc, or the soap and opium liniment. Warmth to the feet, and the recumbent posture, are also to be recommended. In very severe or protracted cases, opium may be taken internally. A good remedy in such cases is a full dose of castor-oil (one ounce or more for an adult), with 30 or 35 drops of laudanum, or of solution of morphia. (Opiates should not be given to children except under medical advice, and in very reduced doses.) When C. resists such mild and simple remedies as the above—when it is accompanied by tenderness of the belly, or by hard swelling in any part of it—when constipation is obstinate, or vomiting is present—when there is feverishness, or tendency to exhaustion—or when there is reason to believe that it may depend on any other cause than the mere accumulation of the products of digestion in the intestines, no time should be lost in seeking the best medical assistance that can be procured; for C. is closely allied as a symptom to several very severe and dangerous diseases. One of these complicated forms of C. is termed Ileus (Gr. *eileon*, from the idea that its seat was in the small intestine (*ileum*). It is attended with obstruction of the bowels, often from mechanical twisting or involution of one part with another (hence termed *volvulus*). This is, of course, a disease of extreme danger. The only treatment that can be attempted without medical assistance, is the employment of large injections by the lower bowel, and opium in moderate and repeated doses (½ grain to 1 grain, or 12 to 20 drops of laudanum) by the mouth, carefully watched, and discontinued if there is any sign of narcotism. See Opium. C. pains are also present in Peritonitis (q. v.), another most dangerous form of disease; and they form one marked symptom of the slow poisoning by Lead (q. v.), occasionally observed as the consequence of contamination of drinking water by leaden cisterns, &c. In this form, the treatment is different from that of simple C., and will be treated of under lead-poisoning.

**COLIGNY**, Gaspard de, a French admiral and general of eminence, was born at Châtillon-sur-Loing, February 16, 1517. Introduced at court, he served under Francis I. in Italy, where he evinced great bravery. Under Henry II. he was made an infantry colonel, and in 1552, admiral of France. On the death of Henry II., C., who had previously adopted the reformed faith, became, with the Prince of Condé, one of the great leaders of the Huguenots. In this capacity he was remarkable alike for his prudence and his bravery. He had the intelligence to plan, as well as the daring to execute, and above all, a heart that was not to be cast down by disasters. At the battles of Dreux and Jarnac, in the former of which Condé was taken prisoner, and in the latter killed, C.'s skill saved the remains of the Protestant army. When peace was concluded in 1570, C. went to court, and was apparently well received by the king (Charles IX.); but the enmity of the Guises, by whom C. was unjustly accused of murdering the Duke of Guise at the siege of Orleans, was stirred up against him, and an attempt was made by one of their menials to assassinate him on the street, August 22, 1572. This attempt at individual murder was but a preliminary to the general massacre of Huguenots which took place two days afterwards, and in which C. was basely slaughtered, his body being afterwards exposed to the vile outrages of the mob.

**COLI'MA**, a name of various application in Mexico.—1. A volcano of the Cordilleras, with an elevation of about 12,000 feet, in lat. 20° N., and not far from the western coast of the republic.—2. A territory of the Confederation, with about 62,000 inhabitants, extending about 100 miles along the shores of the Pacific, in lat. 19°—20° N.—3. The capital of the territory, comprising more than half of its population, stands in a fertile plain to the south-west of the volcano.—4. A seaport on the Pacific, about 40 miles to the south-west of the capital.

**CO'LIN.** See Virginian Quail.

**COLL**, one of the Western Isles of Scotland, off the west coast of Mull, and forming part of Argyleshire, and 2½ miles north-east of Tiree Isle. It is 12 miles long from north-east to south-west, with an average breadth of 2½ miles. More than a third of it is cultivated, or in pasture. The isle is low and rocky, and composed of gneiss, approaching to granite and hornblende slate. Pop. 1109, engaged in agriculture and fishing.

**CO'LLAR-BEAM, STRAI'NING-BEAM**, &c., the horizontal tie connecting a pair of rafters. Large roofs have two or more collar-beams.

**CO'LLARING**, the cylindrical part of the capital in the Doric and Tuscan orders. It is often termed the neck.

**COLLA'TERAL** (Lat. *collateralis*). See Consanguinity, Succession.

**COLLATERAL SECURITY**, is an additional and separate security for the performance of an obligation, or the implement of a bond or covenant.

**COLLA'TION**, in the Law of England, is where a portion advanced by the father to a son or daughter is brought into *hotch-pot* (q. v.), in order that the beneficiary may have an equal share of his personal estate at his death. C. in this sense corresponds to the C. amongst younger children in Scotland. But in that country there is also the C. between the heir and executor. If the heir accept the heritable (real) estate of the deceased, however small it may be, he has no claim to share in the executry or movable (personal) succession; but should he consider it for his interest, he may claim the share of the movable estate which falls to him as next of kin, on condition of his ceasing to be heir by collating the heritage with the executors. The privilege is not confined to a son, but extends also to brothers and other collaterals.

**COLLATION TO A BENEFICE** is the act of bestowing a benefice by the bishop or other ordinary, where he has right of patronage. When a bishop *confers*, or collates to a benefice, presentation and institution are both comprised in the act of collation.

**CO'LLÉ**, a town of Tuscany, situated on the Elsa, about 22 miles south-south-west of Florence. A steep ridge separates the town into two portions, the lower of which is chiefly occupied by manufactories. C. has a cathedral and castle, and its paper-manufacture is extensive. Wine, olive-oil, and silk are produced in the environs. Pop. 6230.

**CO'LLECT**, a name of uncertain origin, given to certain short prayers in different church-liturgies. It is from the Latin *colligere*, as some ritualists think, because of the comprehensive brevity of such prayers, the matter of the epistle and gospel, e. g., being gathered up, or *collected*, into the C. for the day, as appears in the English Common Prayer Book. Others, with more probability, ascribe to the name an origin from an ancient practice of the chief minister collecting into a single brief prayer at the end of the service the previous devotions of the people; accordingly, one of the service-books of the ancient Catholic Church was called *Collectarium*, as containing such prayers. Of the collects used in the liturgy of the Church of England, some are taken from the old Roman Missal, and were probably the composition of St Jerome; others are of more ancient and primitive times, and a few were composed at the Reformation. They begin with commemorating some attribute of God, or pleading some infirmity or necessity of man, and end with a simple petition based thereupon. Hence it will be seen that the practical teaching of a church may to a great extent be seen in its collects. For every Sunday, there is a proper C., with corresponding epistle and gospel; and this C. stands for every day in the following week, except in the case of festivals and their eves or vigils, which have collects of their own.

**COLLECTIONS AT CHURCHES.** The collections which are still made at all churches in Scotland—either at the church-doors before the service, or in the church after it—were, till a comparatively recent period, the principal fund for the support of the poor. By a proclamation of the Privy Council of 29th August 1693, it was ordered that one-half of the sums so collected, and of dues received by the kirk-session, be paid over into the general fund for the support of the poor. The other half has generally been applied for the relief of sudden or temporary distress. By the Poor-law Act (8 and 9 Vict. c. 83), it is enacted (s. 54) that in all parishes in which it has been agreed that an assessment shall be levied for the relief of the poor, all moneys arising from the ordinary church collections shall in future belong to, and be at the disposal of, the kirk-session; provided, however, that they shall be applied to no purposes other than those to which they were, in whole or in part, legally applicable before the date of the act. A power is reserved to the heritors to examine the accounts of the kirk-session, and to inquire into the manner in which the collections are applied; and the session-clerk is enjoined to report annually as to the application of the moneys, to the Board of Supervision.

The collections made at dissenting meeting-houses, under which denomination Episcopal chapels are included, are entirely at the disposal of the congregations.

In England, there are no regular C. at churches as in Scotland. The alms collected in chapels, as well as in parish-churches, during the reading of the offertory, are declared by the rubric to be at the disposal of the incumbent and churchwardens of the parish, and not of the minister or proprietor of the chapel. If the minister and churchwardens disagree as to the distribution of the alms, they shall be disposed of as the ordinary shall appoint. See Offertory.

**CO'LLEGE** (Lat. *collegium*, a collection or assemblage). In its Roman signification, a C. signified any association of persons for a specific purpose. In many respects it was synonymous with *corpus*, a body or collection of members, a corporation—with *universitas*, a whole as contrasted with its parts—and with *societas*, a company or partnership, as opposed to all the members of which it was composed. A Roman C. had a common chest, and it could sue and be sued in the name of its manager (actor or syndicus), just like an incorporation with us. It required also to be incorporated by some sort of public authority, springing either from the senate or the emperor. A C. could not consist of fewer than three persons, according to the well-known maxim, 'three make a college' (Dig. 50, tit. 16, l. 85). Some of these colleges were for purely mercantile purposes, but there were others which had religious objects in view, such as the *Collegia Pontificum*, *Augurum*, &c., and which thus made a sort of approach to a C. in the modern sense. With us, a C. is an incorporation, company, or society of persons, joined together generally for literary or scientific purposes, and frequently possessing peculiar or exclusive privileges. See Physicians, College of; Surgeons, College of. Very often in England a C. is an endowed institution connected with a university, having for its object the promotion of learning. In this relation, a C. is a sub-corporation, i. e. a member of the body known as the University. The constitution of a C. in this, its most general and proper sense, depends wholly on the will of the founder, and on the regulations which may be imposed by the visitor (q. v.) whom he has appointed. For a more detailed account of C. in this sense, see University, Oxford, Cambridge, Paris, Edinburgh, &c. In Scotland and in America, the distinction between the C. as the member, and the university as the body, has been lost sight of; and we consequently hear of the one and the other indiscriminately granting degrees, a function which in the English and in the original European view of the matter belonged exclusively to the university. Where there is but one C. in a university, as is the case in all the universities of Scotland, the two bodies are of course identical, though the functions which they perform are different. In Germany, there are no colleges in the English sense; and though the universities in that country perform precisely the same functions as in Scotland, the verbal confusion between the C. and the university is avoided by the latter performing the functions of both in its own name, as two separate parts of its proper duties. In France, C. has a meaning totally different from that which we attach to it: it is a school, corresponding, however, more to the gymnasium (q. v.) of Germany than to the grammar-school of this country. All the colleges are placed under the university of France, to which the centralising tendencies of that country have given a meaning which also differs widely from that which the term University bears in England. See University of France.

**COLLEGE OF ARMS.** See Heralds' College.

**COLLEGE OF JUSTICE,** in Scotland, which was formed on the model of the Parliament of Paris (q. v.), consists of the supreme civil court (see Court of Session), with all its members and officers. The title occurs in the statute 1537, c. 36; and in 1540, c. 93, the judges are styled senators. The present members of the C. of J. are, in addition to the judges, advocates (Anglicè, barristers), clerks of session, clerks of the bills, &c.; writers to the signet, solicitors before the supreme courts (not solicitors at law), depute-clerks and their substitutes, &c.; clerks of Exchequer, directors of Chancery, and their depute and clerks, the writer to the privy seal and his depute, clerks to the general registers of sasines and hornings, macers of the Court of Session, the keeper of the minute-book, the keeper of the rolls of the Inner and Outer House, one clerk to each judge, one clerk to each advocate, the extractors in the Register House, and the keeper of the Advocates' Library. In addition to the above, the keeper of the judicial records, the assistants to the principal clerks of session, the auditor of the Court of Session, and the collector of the fee-fund, are members *ex officio* by 1 and 2 Geo. IV.

**COLLEGIATE CHURCHES**—so called from having a college or chapter, consisting of a dean and canons, attached to them—differ from cathedrals in that the see of the bishop is at the latter. The service is or should be the same in both. They are under the jurisdiction of the bishop of the diocese in which they are situated, and he exercises visitorial powers over them. Those remaining in England are Westminster, Windsor, Wolverhampton, Heytesbury, Southwell, Middleham; also Brecon in Wales, and Galway in Ireland. Ripon and Manchester have been constituted the cathedrals of the new dioceses. Some churches called collegiate (as Beverley) have no chapters.

**CO'LLIER**, Jeremy, a celebrated nonjuring clergyman, was born in Cambridgeshire on the 23d September 1650. He went to Cambridge in 1669, and took his degree of M.A. in 1676. At the revolution of 1688, he first plunged into the stormy waters of controversy, his foeman being Burnet, afterwards Bishop of Salisbury. For a publication of his at this time, entitled *The Desertion Discussed*, which gave offence to the government of William, he was sent to Newgate, where he remained several months. On his release, he rushed anew into the wars of party, and distinguished himself therein by the publication of several controversial works. Suspected of being a partisan of the Stuarts, he was again arrested in 1692, and imprisoned for a short time in the King's Bench. From this period, his life was a scene of perpetual literary strife, government being the principal object of his attack. He died in London, 26th April 1726. C. wrote many books, including the *Ecclesiastical History of Great Britain;* but the work by which he is best known, is his *Short View of the Immorality and Profaneness of the English Stage*, published in 1698. Congreve and Farquhar came to the rescue of their craft, to the great delight of C., who was never happier than when wielding the satirical whip, and who had no objection to encounter a couple of opponents at a time. The combat lasted for ten years, and at the close, C. remained master of the field. His strictures on the stage were needed at the time, and his writings materially aided its subsequent purification. He was engaged in strife up to the close of his career, and died almost with arms in his hands.

**COLLIER**, J. Payne, a well-known Shakspearian critic and commentator, was born in London in 1789. In 1820, he published *The Poetical Decameron*, in 2 volumes. From 1825 to 1827, he superintended a new edition of Dodsley's *Old Plays*, in 13 volumes. Mr C., whose position in connection with the library of the Duke of Devonshire, gave him great advantages for the study of our early dramatic literature, published in 1831, in 3 volumes, what may safely be called his best work, a *History of English Dramatic Poetry to the Time of Shakspeare, and Annals of the Stage to the Restoration.* From 1835 to 1839, he published, also in 3 volumes, *New Facts regarding the Life and Works of Shakspeare.* He also gave to the public an edition of the works of the illustrious Bard of Avon (1842—1844). Not content with these efforts for the illustration of his favourite author, Mr C., in 1852, published a volume, entitled *Notes and Emendations to the Text of Shakspeare's Plays, from early manuscript Corrections in a Copy of the Folio of* 1632, *in the Possession of J. P. Collier.* This publication excited great commotion in the literary world; opinion was divided, and the *Emendations* were furiously applauded or furiously assailed. It was in time generally admitted, that many of them were just corrections of typographical errors; that many, in cases where the author's meaning was doubtful, displayed very remarkable ingenuity; but that others darkened texts which, to any eye but that of a commentator's, were transparent enough. Afterwards, however, there arose a controversy of a more serious nature regarding this volume, one in which the honour of Mr C. was called in question, it being alleged that he had himself written the marginal emendations of his folio in a feigned hand.

**COLLI'N**, or **KOLI'N**, a town of Bohemia, picturesquely situated on the left bank of the Elbe, about 39 miles east-south-east of Prague, on the railway between that place and Vienna. It is surrounded by walls, is well built, and has an old castle, and manufactures of cotton and potash. Carnelians, garnets, and topazes are found in the neighbourhood, and polished here. Pop. 6200. In the vicinity was fought, in 1757, the famous battle in which Frederick the Great was defeated by the allied Austrian and Saxon armies under Marshal Daun.

**CO'LLINE** is a term applied to common gelatine, or Glue (q. v.).

**CO'LLINGWOOD**, Cuthbert, Admiral Lord, was born at Newcastle-upon-Tyne, 26th September 1750. Sent to sea as a midshipman at the age of eleven, his life thenceforth, with the exception of some half-dozen years, was spent wholly on board ship. He was an intimate friend of Nelson, whom he followed up the ladder of promotion step by step, until Nelson's death left the topmost round vacant for himself. Among the great naval victories in which C. bore a prominent part, were those of Lord Howe off Brest in June 1794; of Lord Jervis off Cape St Vincent in 1797; and of Trafalgar in 1805, where he held the second command. In the last-named engagement, his ship was the first to break through the line of the combined French and Spanish fleets; and after Nelson had received his death-wound, he assumed the chief direction, and completed gloriously the triumph which had been so daringly commenced. A peerage was his reward for his gallant conduct in this battle. After several years' able service in the Mediterranean, C. died at sea, March 7, 1810. He was a thorough seaman, unsurpassed, if not indeed unequalled, by any officer in the navy. He never permitted his ardent courage to outrun his cool judgment. At once firm and mild in command, the seamen appropriately called him their father; while his private virtues and generous kind nature endeared him to all who came in contact with him as equals.

**CO'LLINS**, Anthony, an able free-thinking writer on religious questions, was born in 1676, at Heston, near Hounslow, in Middlesex. He studied at Eton, and afterwards at King's College, Cambridge. In 1707, he published his *Essay concerning the Use of Human Reason;* and in 1709, his *Priestcraft in Perfection*, &c., which fluttered the churchmen of that time exceedingly. The controversy excited by this last work induced C. to write his *Historical and Critical Essay on the Thirty-nine Articles.* His next work was a *Vindication of the Divine Attributes*, in reply to the Archbishop of Dublin, who asserted the compatibility of Divine Predestination and Human Freedom. C. was a philosophical Necessitarian, and afterwards advocated his opinions more fully in his *Philosophical Inquiry concerning Liberty and Necessity* (1715). In 1711, he went to Holland, where he made the friendship of Le Clerc and other eminent *literati.* On his return to England, he published his *Discourse on Free-thinking*, the best known, and the most important of all his works. In 1718, he was made treasurer for the county of Essex; and in 1724 appeared his *Grounds and Reasons of the Christian Religion*, which gave occasion to no less than thirty-five replies. Two years later, he defended himself in his *Scheme of Literal Prophecy;* and in 1727, published his last work, a reply to Dr Roger's *Eight Sermons on the Necessity of Revelation and the Truth of Christianity.* C. died December 1729. He was a friend and correspondent of Locke, who declared that 'C. had as much love of the truth for the truth's sake, as ever he had met with in anybody.' His character for integrity and benevolence stood very high.

**COLLINS, William,** a poet of considerable merit and reputation, was born December 25, 1721, at Chichester, where his father was a hatter. He received his education at Winchester College and Oxford. In 1742, he published a small volume containing the *Oriental Eclogues*, and the *Epistle to Sir Thomas Hanmer*. These are not so characteristic of his genius as his later writings. Although the publication was not attended with success, he resolved upon a literary career, and with this object went to London in 1744. Here, from time to time, he published other poems, chiefly consisting of odes; but misfortunes, occasioned chiefly by his own indolence and irresolution, finally rendered him a prey to melancholy, which at times deepened into insanity. This has imparted an interest to his memory which his works alone might not have been able to excite. He died at Chichester in 1756. The poems which he has left are comparatively few; but they entitle him to no mean rank among the poets of the 18th century. He was essentially a lyrical poet; and it is upon his odes that his reputation is principally founded. All his best qualities are exhibited in the well-known ode on *The Passions*—a poem which, at the time it was written, was undoubtedly one of the finest odes in the language. The personification of the passions is true and striking, and the variation of the measure is well adapted to the various emotions to be expressed. Among his other pieces may be mentioned the odes *To Liberty*, *To Mercy*, *To Evening*, *Ode written in* 1746, and the first part of the ode *To Fear.*

**COLLINS, William, R.A.,** a distinguished English artist, was born in Great Tichfield Street, London, September 18, 1787. C. early displayed a decided taste for art. In 1807 he entered the Royal Academy as a student, and in the same year he exhibited two pictures at the Academy's exhibition. At first, necessity obliged him to devote himself to portraits, but money coming in rapidly, he was soon able to give his genius its bent; and his children swinging on gates, his children gazing in delighted wonderment on the newly discovered nest, his coast-scenes, his groups of prawn-fishers, his shrimpers on the ebbed sea-beach, drew admiring eyes as they hung on the Academy walls, and brought remunerative prices. C. was elected R.A. in 1820. In 1836 he visited Italy, and remained there nearly two years, studying the great masters, and sketching monks and peasants, and groups of bronzed children. In 1839 he sent to the Academy several Italian pictures, which were greatly admired. His attempts in another direction—'Our Saviour with the Doctors in the Temple' (exhibited in 1840), and 'The Two Disciples at Emmaus' (1841)—were not particularly successful, and he wisely fell back on his green fields, his sea-beaches, his rustics, and his children at their games. His death took place in London on the 17th February 1847.

**COLLINS, William Wilkie,** son of the preceding, was born in 1825, and was educated for the bar. He is widely known as a novelist and miscellaneous writer. He is a great master of mystery, and can so hide a secret in a wrappage of circumstance, that, before it is discovered, the whole tissue must be unrolled. Several of his works are models of construction; and in working out his plots, he diverges neither to left nor right, indulges neither in irrelevant pathos nor description, but keeps strictly to the business in hand, pursues his *dénouement* through his three volumes steadily as the blood-hound the track of the fugitive. His principal works are *Antonina*, *Basil*, *Hide and Seek*, *After Dark*, *The Dead Secret*, and *The Woman in White.*

**COLLISIONS OF VESSELS.** To prevent vessels running against one another in passing, there is a 'rule of the road' at sea as well as on land. The Trinity House lays down regulations which, though not having the force of law, are recognised by the Admiralty. They are too technical to be given here; but, in general, they are analogous to the rules observed by pedestrians in crowded thoroughfares, and by vehicles on highways. It is at night that the danger of collision is greatest; and hence the necessity for a well-arranged system of lights and other precautions. In the *Wreck Chart* for 1858, published by the Board of Trade, it is shewn that, in that year, there were 50 vessels totally lost by C. off the coasts of the United Kingdom; while 251 other vessels were more or less injured from the same cause.

**COLLO'DION** (Gr. *kollao*, to stick). This substance, on its first introduction, employed in surgery as a preservative of wounds, &c., from contact of air, by means of the tenacious and transparent film which it leaves on evaporation—and now, also, in a slightly modified form, remarkable as the basis of a highly sensitive process for taking pictures by the agency of light—may be defined as a solution of *Pyroxyline* in a mixture of alcohol and ether, to which is added, for photographic operations, a small quantity of some soluble iodide, bromide, or chloride.

The first step in making C. is the preparation of pyroxyline: Take 10 fluid ounces of sulphuric acid, specific gravity 1·84, in a dish; add 12 fluid drachms of water, and 10 fluid ounces of nitric acid, specific gravity 1·45; and raise the temperature to 140° by immersing the dish in boiling water. One ounce of pure linen or paper should now be immersed in small pieces at a time, keeping the mixture in motion until the liquid is nearly absorbed by the linen or paper.

The action having continued for about ten minutes, the contents of the dish should be plunged into a vessel containing a large quantity of water, which should be speedily poured off and repeatedly changed, until the linen or paper is so thoroughly washed as not to give the slightest indication of acid to the most delicate test-paper, after which it should be slowly dried at a low temperature, and preserved in a glass bottle for use.

One hundred and four grains of the pyroxyline thus prepared are dissolved in a mixture of 16 oz. of pure sulphuric ether, and 2 oz. alcohol, specific gravity ·840; and to this mixture are added 48 grains iodide of cadmium, 30 grains iodide of potassium, and 25 grains bromide of cadmium, dissolved in 4 oz. of alcohol, of specific gravity ·840. C. thus prepared should, after becoming clear by subsidation, yield a rich creamy film of iodide and bromide of silver on immersion in the nitrate bath.

The foregoing formula yields a C. very suitable for taking what are termed *negative* impressions in the camera; but when it is desired to take *positive* pictures, cotton wool should be substituted for linen or paper in the preparation of the pyroxyline, and the iodising solution should contain iodide of ammonium instead of iodide of potassium. It is important also that the alcohol employed should be free from organic impurities in the shape of fusel and grain oils, small traces of which mar the purity of the high lights in a positive, though their presence is comparatively harmless in a negative photograph. For the details of manipulation involved in, and apparatus required for, the practice of the C. process, the reader is referred to the excellent treatise by Mr Hardwich on that subject.

**COLLODIONI'SED PA'PER PRO'CESS.** Paper being substituted for glass in this process, as a basis upon which to support the film, a great increase in portability is arrived at, as the sensitive sheets may be carried in a portfolio, and employed in the same manner as dry collodion plates. There are difficulties, however, in the way of its successful practice, which have prevented it from becoming as popular as it deserves to be. The following is a brief summary of the manipulations. Mr Corbin, the inventor of the process, ascertained that a peculiar collodion was requisite, the formula of which is as follows: ether, 650 parts; alcohol, 350 parts; pyroxyline, 15 parts; iodine, $1\frac{1}{4}$ part. The collodion so prepared is poured on the glass in the usual way, and sensitised in a bath containing only one per cent. of nitrate silver, and a half per cent. of nitric acid. The plate having remained in this bath about two minutes, is withdrawn, and freely washed with water; it is then immersed in a solution of one per cent. of iodide of potassium, to insure the complete decomposition of the whole of the free nitrate of silver not removed by the washing. A piece of negative paper is now coated with a solution of gelatine, containing 6 parts of gelatine to 100 parts water; the dimensions of the paper should be rather less than the glass, and the gelatinised side is brought into contact with the collodion film in a dish of water, any intervening water being expelled by passing a glass rod lightly over it. The edges of the collodion film which project beyond the paper are folded back on it, and the film and paper removed together. The now collodionised paper is laid, film uppermost, on a glass plate, coated with a preservative solution, composed of equal parts of albumen and honey, diluted sufficiently to enable it to flow freely over the paper. The film is lastly sensitised in a solution of nitrate of silver, 5 parts; glacial acetic acid, 5 parts; water, 100 parts; it is then freely washed as before in water, and hung up to dry. As it is apt to wrinkle in drying, it should be attached by all four corners to two lines, running one under the other.

**COLLOT D'HERBOIS,** Jean Marie, one of those men who gained an infamous notoriety in connection with the first French Revolution, was born in Paris in 1750. Originally a provincial actor, the revolutionary movement attracted him to Paris, where his impudence, his loud voice, and his *Almanach du Père Gérard*, which obtained the prize of the Jacobin Club, secured for him public recognition, and he was elected to the National Convention as one of the deputies for Paris. His general ferocity marked him out as a fit person for the presidency of the Convention, to which he was appointed June 13, 1793, and as a member of the murderous Committee of Public Safety. Sent by Robespierre to Lyon in November 1793, C. took bloody revenge on the inhabitants for having once hissed him off the stage in the theatre. Not less than 1600 persons were destroyed by the guillotine and by discharges of grape-shot. An attempt made to assassinate C. (May 23, 1794) served only to increase his popularity, and thus excited the envy of Robespierre, who determined to destroy so formidable a rival. C. therefore took a prominent part in the overthrow of Robespierre and his party in July 1794, but the reaction following this event proved fatal to himself. C. was expelled from the Convention, and in March 1795 was sentenced to deportation to Cayenne, where he caught a fever, and died in great agony, January 8, 1796. Besides revolutionary pamphlets, C. wrote a great number of dramas, now utterly forgotten.

**COLLU'SION,** an agreement between two or more persons to defraud. The law abhors C., and consequently it has the effect of voiding every transaction which is founded upon it. Arrangements between bankrupts and creditors whom they wish to favour, on the eve of bankruptcy, are amongst the most frequent instances of C., and one of the leading objects of all systems of bankrupt law has been to defeat them. In England, C. is spoken of as 'a deceitful agreement or contract between two or more persons, for the one to bring an action against the other, to some evil purpose, as to defraud a third person of his right.'—*Tomlin's Dictionary.* But there is no limit to the circumstances in which the occurrence of C. is conceivable in any country.

**CO'LMAN,** George, commonly called 'the Elder,' a dramatic author and theatrical manager of last century, was born at Florence about 1733. In 1760, his first dramatic piece, entitled *Polly Honeycomb*, was produced at Drury Lane with great success. Next year, he gave to the world his comedy of *The Jealous Wife*, and in conjunction with Mr Garrick, he in 1766 wrote *The Clandestine Marriage.* In 1761, he became one of the purchasers of Covent Garden Theatre, and held the office of acting manager for seven years, after which period he sold his share. In 1777, he purchased the theatre in the Haymarket from Mr Foote. In 1785, he was attacked by palsy, and never recovered; he died August 14, 1794. C. was an industrious author; besides poetry and translations, he wrote and adapted upwards of thirty dramatic pieces.

**COLMAN,** George, 'the Younger,' son of the preceding, was born October 21, 1762. His bent lay in the same direction as his father's, during whose illness he acted as manager of the Haymarket Theatre; and on the death of the elder Colman, George III. transferred the patent to his son. C. held, for a considerable time, the office of examiner of plays. In industry, he rivalled his father, and he received large sums for his dramatic writings, some of which continue in possession of the stage. He was twice married, and died on the 26th October 1826. His last literary work was *Memoirs*, published in two volumes.

**COLMAR,** a city of France, capital of the department of Haut Rhin, finely situated in a plain near the base of the Vosges, 40 miles north-north-east of Strasbourg. A stream of water from the Lauch and Fecht, at the confluence of which the town stands, flows through and keeps the streets clean. Among the principal buildings of C. are the cathedral, the Dominican church, the college, court-house, and town-house. C. is a busy place—one of the chief seats of the cotton manufacture in France. Water, being abundant, is the principal motive-power in driving the machinery, but steam is also employed to a considerable extent. Other manufactures are paper, leather, ribbons, and hosiery. C. is an old place, having been raised to the rank of a city in 1220. About the end of that century, it was made a free town, and rapidly became one of the most prosperous in Upper Alsace. Fortified in 1552, its fortifications were razed in 1673 by Louis XIV. Pleasant boulevards now occupy their place. Pop. 18,000.

**COLNE**, a town in the east of Lancashire, on a high ridge near the source of the Calder, a western branch of the Ribble, 32 miles north-east of Manchester, at the junction of the Lancashire and Yorkshire and Midland Railways. It has manufactures of cotton calicoes, and mousselines-de-laine. Coal, slate, and lime abound in the vicinity. Pop. 6644. C. is an ancient place, by some supposed to be the *Colunio* of the Romans. Many Roman coins have been found here. As early as the beginning of the 14th c., it was the seat of woollen manufactures.

**CO'LOBUS.** See MONKEY.

**CO'LOCYNTH** (Gr. *kolokynthis*), a well-known medicine, much used as a purgative, is the dried and powdered pulp of the *Colocynth Gourd*, *Coloquintida*, *Bitter Apple*, or *Bitter Cucumber*, a globose fruit about the size of an orange, of a uniform yellow colour, with a smooth, thin, solid rind. The plant which produces it, *Cucumis* (or *Citrullus*) *Colocynthis*, is nearly allied to the Cucumber (q. v.). It is common in Asia, Africa, and Spain, which last country supplies no small part of the C. of commerce. The fruit is gathered when it begins to turn yellow, peeled, and dried quickly either in a stove or in the sun. It is chiefly in the form of a dried extract that it is used in medicine. It owes its properties to a bitter principle called *Colocynthine*, which is more or less abundantly present in the fruits of many of the gourd-family. It is a curious fact, but to which there are many analogous, that the seeds of the C. plant, produced in the midst of its medicinal pulp, are perfectly bland, and they even form an important article of food in the north of Africa.—The name False C. is sometimes given to the Orange Gourd (*Cucurbita aurantia*), sometimes cultivated as an ornamental plant in our gardens, on account of its globose, deep orange-fruit. The pulp of the fruit possesses the properties of C., but in a milder degree.

C. is generally administered in the form of pills, in which the extract is associated with aloes, scammony, and in some cases with calomel or with extract of hyoscyamus. In small doses, the C. acts as a safe and useful purgative; and when accompanied by hyoscyamus, the latter prevents much of the pain and griping which are attendant on the use of C. by itself. In large doses, C. is a poison.

**COLO'CZA**, or **KALOCSA**, a town of Hungary, situated on the left bank of the Danube, 68 miles south of Pesth. It has an archiepiscopal palace or castle, and a cathedral. Pop. 11,400, who are chiefly engaged in the fisheries on the Danube, and in the breeding of cattle. There is a steam-packet station at Colocza.

**COLO'GNE** (Ger. *Köln;* the *Colonia Agrippina* of the Romans), a city and free port on the left bank of the Rhine, in lat. 50° 56′ N., long. 6° 58′ E. Formerly an independent city of the German empire, it is now the capital of Rhenish Prussia. C. is a fortress of the first rank, forming a semicircle, with the Rhine as its chord, and the town of Deutz on the opposite bank as a tête-du-pont. It is connected with this suburb by a bridge of boats and a fine iron bridge 1352 feet in length, for railway and carriage traffic. The population, in 1858, amounted to 114,721, only about 10,000 of whom were Protestants. The streets are mostly narrow and crooked. The public buildings are numerous, including a number of educational and of charitable institutions. The church of St Ursula is noted as the place where are preserved the bones of 11,000 virgins, companions of St Ursula, who, according to the legend, were slaughtered at C. by the Huns, because they refused to break their vows of chastity. In the 'golden chamber' are the coffin of the saint, and the skulls of a few of her most favoured maidens encased in silver. The church of St Gereon, the first portion of which was founded in 1066, boasts of the possession of the bones of St Gereon, and of the 6000 Theban martyrs slain during Diocletian's persecution. The church of St Peter is celebrated for the altar-piece of the crucifixion of St Peter by Rubens, and some of the other churches are interesting both for their architecture and their antiquity. The chief object of interest in the city, however, as well as its greatest ornament, is the cathedral, one of the noblest specimens of Gothic architecture in Europe. This cathedral is said to have had its origin in an erection by Archbishop Hildebold, during the reign of Charlemagne in 814. Frederic the Red-bearded bestowed upon it, in 1162, the bones of the three holy kings, which he took from Milan, and this gift contributed greatly to the increase of its importance. The bones are retained as precious relics to this day; but the old structure was burned in 1248; according to some accounts, the present cathedral was begun in the same year, but others fix the date of its commencement in 1270—1275. To whom the design of this noble building is to be ascribed, is uncertain. The choir, the first part completed, was consecrated in 1322. The work was carried on, sometimes more actively, sometimes more slowly, till the era of the Reformation, when it was suspended; and during the subsequent centuries, not only was nothing done to advance it, but what had been already executed, was not properly kept in repair. In the beginning of the present century, however, attention was directed to its unrivalled beauties, and it has since become the subject of an enthusiasm extending over all Germany, and which has given birth to a multitude of associations for the supply of the necessary funds to repair and complete it according to the original design. Funds have also been forthcoming from other parts of Europe. On September 4, 1842, the king of Prussia, who had contributed largely to the funds, laid the foundation-stone of the transept, since which time great progress has been made. The naves, aisles, and transepts were opened in 1848. The magnificent south portal was completed in 1859, and the north has also been finished; and in 1860, the iron central spire was added. With the exception of the towers, the whole is expected to be completed in 1862 or 1863. The body of the church measures 511 feet in length, and 231 feet in breadth. The towers, when finished, will be upwards of 500 feet in height. The cost of the restoration is estimated at £750,000.—The situation of the city is extremely favourable for commerce, and it has long possessed a considerable and increasing importance in this respect. Various branches of manufacture are carried on, including those of cotton-yarns, woollens, velvets, silk fabrics, &c., but that of Eau-de-Cologne (q. v.) is the most remarkable. There are between 20 and 30 manufactories of this article, whose savour is not sufficient to sweeten the place, which is one of the most offensive to the nostrils in Europe.—The city was founded by the Ubii, about 37 B. C., and was at first called *Ubiorum oppidum;* but a colony being planted here in 50 A. D. by Agrippina, the wife of the Emperor Claudius, it received the name of *Colonia Agrippina.* At the partition of the Frank monarchy in 511, it was included in Austrasia; and by a treaty in 870, was united to the German Empire. It entered the league of the Hanse towns in the beginning of the 13th c., and contended with Lübeck for the first rank. It was at a very early period the seat of a bishopric, which was elevated, in the end of the 8th c., into an archbishopric, and the archbishops acquired considerable territories, some of them distinguishing themselves as politicians and warriors. They took their place amongst the princes and electors of the empire, but were involved in a protracted contest with the citizens of C., who asserted against them the independence of the city, and the archiepiscopal residence was therefore removed to Bonn. The archbishopric was secularised in 1801, when the city also lost its independence, and the congress of Vienna did not attempt to restore to it its former character, but assigned the whole territories to Prussia. The archbishop, therefore, has not now the political rights and power that belonged to his predecessors.

**COLOGNE YELLOW** is a pigment composed of 2 parts of yellow chromate of lead, 1 of sulphate of lead, and 7 of sulphate of lime or gypsum.

**COLOMBA'NO**, San, a town of Lombardy, Northern Italy, on the right bank of the Lambro, about 10 miles south of Lodi. It is situated in the midst of hills, in which are found porphyry, feldspar, and fine red granite, and also limestone containing numerous fossils. Pop. 5000.

**COLO'MBIA**, now a mere term of history, embraced, immediately after the war of independence, all that now belongs to the three republics of Venezuela, New Granada, and Ecuador, being the entire north of South America, and the extreme south of what is geographically distinguished as Central America. Independently of the singular difficulties of communication, and of the resulting absence of anything like natural unity, this unwieldy state contained, from the beginning, the cause of its own dissolution in the national character of its inhabitants—that same national character which, since the beginning of 1859, has been eagerly dismembering New Granada itself into its constituent provinces. So long as union was necessary to meet external dangers, C. maintained an imposing attitude in the eyes of the world; but, gradually, sectional interests and political jealousies did their work, and at last, about 1830, the ill-assorted elements of the confederation were separated for ever.

**COLO'MBO**, the capital of Ceylon, an episcopal city and seat of government, is situated on the western side of the island, in 6° 59′ N. lat., and 80° 4′ E. long., near a rocky headland, the *Jovis Extremum* of Ptolemy, by which the mariners of antiquity steered for the port of Galle. The modern fortifications of C., which were constructed by the Dutch, include, on the land-side, four bastions with counterscarps and ravelins, and, towards the sea, seven batteries. Except the military officers, few Europeans reside within the fort. Colpetty, a beautiful suburb, shaded by groves of the cocoa-nut palm, is a favourite retreat. Here, the houses are chiefly of one story, with broad verandahs. The large and lofty rooms are furnished with punkahs, floored with tiles, and, for the sake of air, have windows opening to the ground, at which, however, snakes, lizards, scorpions, and the teeming insects of a tropical country, make free to enter. The humble, mud-constructed dwellings of the Dutch, Portuguese, Eurasians, Singhalese, Tamils, Moors, and Malays are outside the city walls. The *pettah* or Black Town, the only ancient quarter, extends to the river Kalany-ganga. The population of C. amounts to about 40,000. The mean annual average of temperature at C. is 80°, or thereabout, and has reached to 86° in extraordinary years. The annual fall of rain is 72·4 inches, of which the greatest quantity is measured at the change of the monsoon, when it pours down in a perfect deluge. Out of 72·4 inches, 20·7 fall in April and May, and 21·9 in October and November.

The early name of C., Kalan-totta, the 'Kalany Ferry,' so called from its proximity to the river, the Moors corrupted into Kalambu, and by this designation it was described about 1340 A.D. as the finest city of Serendib. At the arrival of the Portuguese, who fortified it 1517 A.D., Kalambu had merged into Kolamba or Columbu, which they henceforth wrote Colombo, in honour of Christopher Columbus. The Dutch succeeded to the Portuguese (see Ceylon), and C. was taken by the British, 16th February 1796.—Sir James Emerson Tennent's *Ceylon*.

**CO'LON.** See Punctuation.

**COLON**, that portion of the large intestine which extends from the Cæcum (q. v.) to the rectum, which is the terminal portion of the intestinal canal. Whether it is derived from *koilon*, 'hollow,' or *kōlao*, 'I arrest' (because the fæces are retained for a considerable time in it), is uncertain. It is divided into the ascending, the transverse, and the descending C., and the sigmoid flexure. See Alimentary Canal.

The whole length of the C., from its commencement in the cæcum, to its termination in the rectum, is rather more than four feet. It is retained in its position by the serous membrane, which envelops, more or less, all the intestinal viscera, and is termed the Peritoneum (q. v.). Its structure is essentially the same as that of the rest of the intestinal canal, which is described in the article Digestion, Organs and Process of; but in consequence of a peculiar arrangement of the longitudinal muscular fibres, the interior of the C. is divided into sacculi, which serve to retain its contents for a longer period than if it were a uniform tube, and thus, by extracting water from them, to reduce them to a more solid consistence, such as is possessed by normal excrement. In some animals, as in the horse and sheep, the shape of the fæces is completely moulded in these cells.

**CO'LONEL** (formerly *Coronel*, from Lat. *corona*, a crown—the chief) is the highest officer of a regiment; any grade above this converts him into a general-officer belonging to the army collectively, rather than to any one regiment. There was an office of colonel-general in the French army in the 16th c., and a similar title was afterwards used for a short time in England. Before the reign of Elizabeth, the chief officer of an English regiment was captain; but in 1588, the title of C. had become familiar. In the British army at the present day, the office of C. is a sinecure, the real active commander of the corps being the lieutenant-colonel. The C. receives higher pay and dignity, but bestows only occasional attention on the affairs of the corps. Most of the colonels are generals, who have had what is called a regiment 'given to them,' as a pecuniary and honorary reward for services in the field, or who have obtained this advantage through court or parliamentary influence. The pay varies from £500 a year in the infantry of the line, to £1800 a year in the Horse Guards and Life Guards. The Army Estimates provide, at the present time, for about 135 colonels. The rank of C. is above those which are purchasable. See Commissions, Army. The duties which ought to devolve on the C. of a regiment, but which are really undertaken by the officer next below him, are described under Lieutenant-colonel. In the Austrian, Prussian, and Russian armies, where the regiments are very large, the colonelcies are mostly honorary posts, held by emperors, kings, princes, and other distinguished persons, who leave all active duties to their subordinates.

**COLO'NIA DO SANTI'SSIMO SACRAME'NTO**, a port of Uruguay or Banda Oriental, stands on the north or left bank of the Plata, nearly opposite to Buenos Ayres, and about 100 miles above Monte Video, the capital of the state. The place is pretty regularly fortified. As its acquisition would tend to secure to Buenos Ayres the entire command of the interior navigation, the town was seized by Rosas, the dictator of that state; but, in the interest of the freedom of commerce, it was, in 1845, taken from him by the French and English squadrons.

**COLO'NIAL CORPS** are certain regiments forming part of the regular army of the British Empire, and paid for out of the imperial revenues. They are not fluctuating, temporary, or depending on certain contingencies, but defined in relation to the colonies to which they belong. The following are the names of the corps, the numbers provided for in the Army Estimates for 1860—1861, and the composition of each corps, whether British or native:

| | | |
|---|---|---|
| Three West India Regiments, | 3420 | Native. |
| Newfoundland Veterans, | 229 | British. |
| Ceylon Rifles, | 1585 | Native. |
| 〃 Invalids, | 163 | British. |
| Cape Mounted Rifles, | 1084 | Mixed. |
| Malta Fencibles, | 638 | Native. |
| Canadian Rifles, | 1106 | British. |
| St Helena Regiment, | 433 | 〃 |
| Gold Coast Artillery, | 351 | Native. |
| Falkland Islands Company, | 37 | British. |
| African Artillerymen, | 64 | Native. |
| Hong-kong Gun Lascars, | 88 | 〃 |

These corps, comprising about 95 companies, have somewhat over 1000 officers, commissioned and non-commissioned, and about the same number of horses. All the corps are officered by British, except the Malta Fencibles. The Cape Mounted Rifles was originally an infantry corps, and still receives infantry pay, with an extra allowance to officers for their horses; its members are white or European inhabitants of Cape Colony, whether English or Dutch.

These several C. C. were mostly established at a time when representative institutions were scarcely known in the settlements. The large and important Australian colonies do not occupy a place in the list; they have militia and volunteers of their own choosing and paying, with an occasional visit from regiments of the line.

**COLO'NNA**, a village in the Papal States, is noticed because it gives its name to the most celebrated and powerful of all the Roman aristocratic families—the Colonna—from which have sprung a pope, several cardinals, generals, statesmen, and noted scholars.

The C. palace, situated at the base of the Quirinal (Rome), is celebrated for its splendid gallery and treasures of art.

**COLONNA, CAPE** (ancient *Sunium Promontorium*), a headland of Greece, forming the southmost point of Attica, in lat. 37° 38′ N., long. 24° 1′ E. Crowned by the ruins of a temple of Minerva, its summit rising about 270 feet above the water, Cape C. is a conspicuous and remarkable object from the sea. Sixteen white marble columns, from which the cape derives its modern name, are still standing.

**COLONNA, VITTORIA**, the most celebrated poetess of Italy, a member of the above-named family, was the daughter of Fabrizio Colonna, High Constable of Naples, at whose estate of Marino she was born in the year 1490. When four years old, she was betrothed to a boy of the same age, Fernando d'Avalos, son of the Marchese de Pescara. At 17, they were married. After her husband's death in the battle of Pavia (1525), Vittoria C. found her chief consolation in solitude and the cultivation of her poetical genius. During seven years of her widowhood, she resided alternately at Naples and Ischia, and then removed to the convent of Orvieto, afterwards to that of Viterbo. In her later years, she left the convent, and resided in Rome, where she died in February 1547. Her poems were chiefly devoted to the memory of her husband. Among them, the *Rime Spirituali* (Venice, 1548) are remarkable for truth of sentiment and enlightened piety. The most perfect edition of the poems of Vittoria C. was published by Ercole Visconti (Rom. 1840).

**COLONNA'DE** is the name given to a series of columns placed at certain intervals from each other, and arranged in various ways according to the rules of art and the order employed.

**CO'LONSAY**, one of the Western Isles of Scotland, off the south-west part of the mainland of Argyleshire, in the wide entrance of the Firth of Lorn, between the isles of Islay and Mull, with the small isle of Oronsay at the south end, separated by a narrow sound, which is dry at low water. C. and Oronsay are together 12 miles long from north-east to south-west, and one to three miles broad. The surface is irregular, and composed of mica-slate, passing into chlorite-slate and clay-slate, and mixed with quartz-rock and limestone. Half the surface is cultivated. Pop. 837. Next to Iona, C. contains the most extensive remains of religious edifices in the Western Isles. On Oronsay stand a large stone cross and the ruins of a monastery, founded by the Lords of the Isles in the middle of the 14th century.

**CO'LONY** (Lat. *colonia*, from *colonus*, a husbandman; the first inhabitants of a C. being generally people of agricultural pursuits). The term is loosely used to embrace various classes of distant territories subordinate to or dependent on a parent state. A C., however, properly means a body of people formed by migration to a distant region, where they support themselves by industry and the produce of the soil, and are under the protection and attached to the supreme government of the mother-country. Our colonies in Australia and North America, where the natives have either ceased to exist, or do not compete with the colonists for the ownership of the soil, are practical instances of the C. in this its proper sense; but there are many other dependencies of the British crown which deviate more or less from the true characteristics of a colony. Gibraltar and Malta, for instance, are mere fortresses, not affording a profitable emigration-field for a portion of our population, but, on the contrary, requiring that such inhabitants of the United Kingdom as reside there shall be specially remunerated for doing so. The support of these dependencies is justified by the warlike, not the economic policy of the country. On the other hand, territories have afforded profitable residence to our people without being colonies; the most conspicuous of this class is the British Empire in Hindustan, where our people scarcely hold any land, or concern themselves in the occupation of agriculture, from which the term colonist is taken; but reside as the rulers and defenders of the native races. The ancient migrations of nations, by which our own islands, for instance, became peopled, apparently in the first place by Celts, and next by Goths or Teutons, were not colonisation in the fullest sense of the term, since the parent-country kept no control over the settlers, and afforded them no protection. The Greeks were a spreading people, carrying with them their genius and their language. They established communities in Asia Minor, on the coast of Africa, in Italy, and in France; for instance, Marseille was a Greek town, founded by the inhabitants of Phocæa about six centuries before the Christian era. A close connection was maintained between these emigrant communities and the states from which they had removed. Still, however, none of these districts were colonies, according to the definition given above; and it was one of the many triumphs of the organising genius of the Romans, to form the 'C.' according to its most perfect modern acceptation. The principle of responsibility to a central government was brought to its greatest perfection in the policy of Rome, and it was part of this policy that not only every conquered territory, but every district where Roman citizens settled, should be an integral part of the empire. The *colonia* was one of the municipal institutions of the empire, having its own governing corporation dependent on Rome. There were various grades of colonies—some where there was the high privilege of Roman citizenship, and others, where the citizenship was of a humbler grade. Corresponding with the consuls in Rome, there were municipal officers in the colonies, representing, after the Empire was formed, the old republican institutions—these were called sometimes *duumviri*, and sometimes *quatuorviri*—terms, the special application of which has been matter of considerable discussion. The Romans appointed men of very high rank to the government of their provinces or colonies—men who had held such offices as the consulship or prætorship at home, and were called proconsuls or proprætors. It was a feature of the sagacious jealousy of the Roman system, to limit their period of government, lest they should become independent of the empire, and establish separate states; and this idea is followed in the colonial system of the British empire at the present day.

After the fall of Rome, centuries passed before colonisation recommenced; for the various tribes who devastated the empire were not connected with any parent state, and the Normans, who spread themselves over Europe at a later period, were utterly unconnected in the countries where they settled, with the government of the northern states whence they migrated. It is curious that not a trace of the genealogy of the Normans of England or France can be found anterior to their settlement in the latter country, so little connection did they preserve with the country of their ancestors. The Spanish and Portuguese were the first among modern European states to establish colonies. Their sovereign aimed not only at the restoration of the Roman empire in Europe, but at the creation of a new empire in America, which was looked on as the exclusive property of the Spanish crown. In carrying out this view, it was not so much that the people of the peninsula went to America, and had the necessary staff of civil and military officers sent to them by the parent state, as that great officers, with high rank and enormous salaries, were sent over to the new empire, and brought followers after them. The other governments of Europe—Britain, France, Holland, and the minor states—subsequently colonised in America and Africa, Denmark occupying the inhospitable shore of Greenland.

The earlier British colonies arose in the reverse order to those of Spain—the colonists went first, the dignitaries followed. Both Raleigh and Drake attempted to form settlements in America, but unsuccessfully. The British race there dates from the reign of James I. of England. The settlers were privileged companies, with royal letters-patent, but, in reality, they were independent; and as they were dissenters seeking a place of refuge from what they considered the grievances of the established church and the government, they took care not to convey the grievance with them, as they would have done had they been actually incorporated with the British empire. The northern colonists, indeed, acted as if they were a sort of private corporation, occupying their own territory according to their own taste, and considered themselves entitled to prohibit any person differing from their religious and political opinions from entering their boundary. In later times, the example of Rome was more closely followed, and it became the policy of Britain, that any land acquired by her subjects by conquest or occupation, should be deemed to be held by them for the crown. This was strongly exemplified in New Zealand, where a body of energetic and spirited adventurers had projected something like a new empire, of which they were to be masters. Some of them had purchased large territories for a musket, a barrel of powder, or a piece of red cloth, and thought it hard that they should not be entitled to retain the fruit of their fortunate bargains. The crown, however, stepped in, asserted a supreme authority over the colony, and readjusted all its territorial rights, with a view to doing practical justice both to the natives and the settlers. There are many evils incident to any attempts at independent colonisation, among which, the chief is the cruelty and rapacity which it is the nature of such private adventurers to exercise against aboriginal tribes, and even against any other communities weaker than themselves who happen to fall in their way. The British colonists of the American continent and islands in the 17th c. were robbers and pirates on a large scale, and became memorable in history by the name Bucaneers. Colonists themselves, when they rightly appreciate their own interest, must see their advantage in the supremacy of the crown—or rather in that of the British parliament—for the crown is only properly supreme over a territory which has been taken by conquest from another civilised power. The supremacy implies a right to protection, much needed by small collections of men in distant regions; and it may be safely predicted, that had an independent body of British settlers established themselves in New Zealand, their C., when it rose to importance, would have been seized by France, or some other foreign power. After the example set by the United States, it is not likely that the supremacy will be continued after it ceases to be advantageous to both parties.

Many fallacies regarding colonies have been dispersed by the progress of political economy. It used to be thought, that the support of colonies at any price was an advantage to our trade, since it is more profitable to trade with our colonies than with foreign countries, because, among other reasons, they can be compelled, by restrictions and monopolies, to take our goods while we take theirs; but other nations cannot, and may continue to sell to us without buying from us. We now know that the best trade for the country, is that which the individual dealers in it find to be the best for themselves; and they will go where they can trade with most profit, whether to a C. or a foreign country. It was when the United States were rich and enterprising—not when they were our colonies—that we have driven the greatest trade with them. No doubt, there must always be two parties in trade; and let a nation be as energetic and enlightened as it may, it will have no foreign trade unless there be some other that can afford and is inclined to deal with it. If the population of the United States were displaced by Red Indians, there would be a sudden collapse in the trade of Britain. For such a reason it is that we have an interest in seeing our own race—the most enterprising in the world—spread over its face. Every new British C. may be calculated on as a new market for our goods; and as a pecuniary speculation, it may be worth supporting a governor and a staff of officers to take charge of it.

Another fallacy, spreading from a different root, has given rise to the notion, that to live in a C. must be more profitable than living in the old country. This is by no means a rule. There are many members of the productive classes whose best market is at home, and who find themselves useless and miserable in a new country. The advantage of the C. is, not that it is a secure profit to every one who will go to it, but that it widens the field of enterprise, and gives a larger choice. It is especially an addition to the existing stock of a very valuable and important kind of raw material—viz., land. It is to the agriculturist, then, that it generally holds out its first inducements. When he has gone there, and begun his work, the bricklayer, the joiner, the smith may follow—in the end, perhaps, there will be employment for the feather-dresser and the maker of satin slippers—and so the enterprising community of our countrymen is enlarged, and there are more transactions and more general wealth.

**CO'LOPHON**, an Ionian city of Asia, about nine miles north of Ephesus, and near the sea-coast. The river Ales, noted for the coolness of its water, flowed past it. It is not often mentioned in history, although the birthplace of several poets, Mimnermus, the elegist, among others, and even claiming to be the native city of Homer. The resin of C. is mentioned by Pliny as an article of commerce. The Greek proverb, 'to put the colophon to it,' meaning to terminate an affair, is said to have originated in the boast of the famous Colophonian cavalry, that their *charge* was usually the finishing-stroke in battle. Hence, in old printed books, the conclusion, in which were stated the name of the author, and the place and year of printing, was called a colophon.

**COLO'PHONY.** See Rosin.

**COLOQUI'NTIDA.** See Colocynth.

**COLORA'DO** (Sp. red), the name of two considerable rivers of North America, both of which flow—the one wholly, and the other partly—through the territory of the United States.—1. The C. of Texas, confined entirely to that state, falls, after a course of about 800 miles, into the Bay of Matagorda, in the Gulf of Mexico. During the season of high-water—that is, in winter—it is navigable for steam-boats as far as Austin, the capital of Texas, which is distant about 200 miles from its mouth. Between Austin and the sea, the river traverses an alluvial plain, adapted to the growth of cotton, rice, and sugar.—2. The C. of the west, rising in the Rocky Mountains, enters the Gulf of California at its very head, about lat. 32° 10′ N., and long. 114° 20′ W. Next to the Columbia or Oregon, it is the largest American tributary of the Pacific, being 1200 miles long. During the dry season, however, its actual volume is comparatively small; while, from a succession of rapids, it can hardly be said to be at all navigable during any season.

**COLO'SSÆ** was a populous city of ancient Phrygia, situated on the river Lycos. Its inhabitants were noted for their skill in dyeing wool. The place was almost entirely destroyed by a great earthquake, 65 A. D., along with the neighbouring cities of Laodicea and Hierapolis. To the Christians of C., Paul addressed one of his epistles, forming part of the canon of the New Testament.

**COLOSSE'UM.** See Amphitheatre.

**COLO'SSUS**, a Greek word of unknown origin, used to denote a statue very greatly beyond the size of life. In English, the adjective colossal is used in a somewhat wider sense, to denote all statues which exceed the size of life, in however small a degree. Most statues are thus colossal, though of colossi, very few have been erected in modern times. The 'Bavaria' (q. v.) at Munich is perhaps the only very celebrated example. The colossal was the peculiar characteristic of Egyptian art, and innumerable colossi were raised in Egypt, mostly of the hardest stone, many of them from 50 to 60 feet in height. The most celebrated is the vocal statue of Memnon (q. v.), in the plain of Thebes, described by Strabo and Pausanias, and supposed to be identical with the more northerly of the two existing colossi on the west bank of the Nile. But it was in the artistic world of Greece that the most famous colossi appeared: e. g., the bronze statue of Pallas Athene, on the Acropolis of Athens, the plume of whose helmet and the point of whose spear were landmarks to sailors between Sunium and Athens; another statue of the same goddess, of gold and ivory—the so-called Palladium in the Parthenon at Athens; and the Olympian Jupiter, of the same materials, the master-piece of Phidias, who was also the author of the two statues just mentioned. Amongst the seven wonders of the Old World, was reckoned the gigantic C. of Rhodes, representing Phœbus, the national deity of the Rhodians. It is said to have been commenced by Chares, of Lindus, a famous pupil of Lysippus, and terminated by Laches. They formed it of metal, which was cast in separate pieces, a process which lasted for twelve years, and was completed 280 B. C. Its height is doubtful—some making it 90 feet; others 90, and even 105 cubits. It cost 300 talents. Sixty years after its erection, it was thrown down by an earthquake. The Romans imitated the Greeks in the erection of these gigantic structures. The statue of Jupiter upon the Capitol, made from the armour of the Samnites, was so large that it could be seen from the Alban Hills. Then there was the bronze statue of Apollo, of which what is supposed to be the head is now in the Capitol; a bronze statue of Augustus, in the Forum; a C. of Nero, executed in marble, of the enormous height of 110 or 120 feet, from which the contiguous amphitheatre is believed to have derived the name of 'Colosseum;' an equestrian statue of Domitian, in the centre of the Forum; and many others.

**COLO'STRUM** is the term applied to the first milk yielded after delivery. It differs very materially from ordinary milk, and generally appears as a turbid, yellowish, viscid fluid, similar to soap and water. When examined under the microscope, it is found to contain, in addition to the ordinary milk corpuscles (see Milk), peculiar conglomerations of very minute fat granules, which are hence known as colostrum corpuscles. The chief chemical difference between C. and milk is, that the former contains nearly three times more salts than the latter. It is probably this excess of salts that usually causes it to exert a purgative effect upon the new-born infant, and thus to remove the Meconium (q. v.) which had accumulated in the fœtal intestine.

**CO'LOUR**, in Optics. See Light, Chromatics, Spectrum.

**COLOUR**, in Art, means either the pigment employed to produce a certain effect to the eye, or the effect thus produced, i. e., the tint of a picture. In the former sense, it is treated of in this work under the names of the colours themselves. See Carmine, Chrome, &c. In the latter sense, C.

must be regarded by the artist not so much as the result of the application of one or more pigments separately, as of their use in the innumerable combinations of which they admit. Synonymous with C. in this sense is the word *colouring*, which has come to be employed as a substantive, indicating the results of the art of combining and applying colours in the imitative arts.

Infinitely various as are the tints exhibited in colouring, it is remarkable that they all result from the combination of the three simple, or, as they are called, primitive or primary colours—*red, blue*, and *yellow*. See Spectrum, Light, &c. Compounded in various proportions, either in twos, or all three together, these three colours produce every hue in nature or in art, every tint that is physically possible. First, when combined in twos, they produce the three *secondary* colours—that is to say, blue and red make purple or violet; yellow and red, orange; blue and yellow, green. The grays and browns, again, are compounds of all three of the primary colours, in unequal and varying proportions.

Complementary Colours are the colours or colour which, with any colour or colours mentioned, make up the three primary colours, which constitute white light. Thus, if the given C. be a primitive, its complementary C. is composed of the other two primitive colours; e. g., the complementary colour of blue is orange = red and yellow. Again, if the given C. be a secondary, its complementary C. is the remaining primitive colour. Thus, the complementary C. of green—blue and yellow—is red.

Contrast of C. is either simple or compound. Each of the primitive colours forms a simple contrast to the other two. Thus, blue forms a simple contrast to red and to yellow. But if red and yellow be mixed together, the complementary C. to blue will be produced—viz., orange, which is the most powerful contrast that can be made to blue.

Harmony of C. consists in the preservation of the same character in a picture throughout, in so far as colouring is concerned. It is said to result from an equal distribution of the three primary colours, either pure or in composition; but such a rule, even if correct, is correct with so wide a latitude as scarcely to admit of practical application. The only method of attaining to a knowledge of harmony of C., is to train the eye by the observation of it as exhibited in nature. A southern sky will be found to harmonise with a southern landscape, and consequently, the colours of which the one is composed with those which compose the other. The experiment may be made by painting an Italian sky over an English landscape, when the want of harmony in the colouring will be at once apparent. The art of preserving harmony without sacrificing variety, resembles that of preserving light in shadow, and combining clearness with depth, which we have explained under Chiar-oscuro.

Warm and Cold Colours are terms derived from the corresponding sensations which they are supposed to produce. Blue is said to be a cold C., and orange a warm one, whereas red is neither warm nor cold. Without supposing colour-blindness, however, it seems very possible to imagine that in this respect the same C. may, from association and other causes, produce different sensations on different persons.

A colourist is an artist in whose works success in colour is the prominent excellence. The greatest colourists are Titian, Correggio, Paul Veronese, Rubens, and perhaps his pupil Vandyck. To say that these artists surpass Raphael, or even Leonardo da Vinci, in this respect, would probably be to say too much. But that they equal these greater artists in this, and in this respect alone, is a sufficient reason for their being known as colourists *par excellence.* The art of colouring admits of being transmitted to pupils to a greater extent than the highest branch of all.

Symbolical Colours. See Symbolism.

**COLOUR**, a rhetorical term, which was adopted into the technical language of English pleading. Previous to the passing of the Common Law Procedure Act of 1852 (15 and 16 Vict. c. 76), it was a rule that pleadings in confession and avoidance, as opposed to pleadings by way of traverse, should confess the matter adversely alleged, to the extent at least of admitting some apparent right in the opposite party requiring to be encountered and avoided by the allegation of new matter. This was called giving C. to the plaintiff's claim. All this curious subtilty, to which English lawyers till recently were in the habit of attaching so much value, was very properly set aside by the statute above referred to. The section which applies to *C.* is the 64th.

**COLOUR**, in Heraldry. The colours used are generally red, blue, black, green, and purple; which are called Gules, Azure, Sable, Vert or Sinople, and Purpure. Tenne or tawny, and Sanguine or blood-colour, sometimes occur, but they are not common. Yellow and white, again, are not colours in the heraldic sense, but metals; they are called Or and Argent, and are always represented by gold and silver. It is a fundamental and invariable rule in blazon, not to put C. upon C., or metal upon metal; thus, if the field be of a metal, the bearing must be of a C., and *vice versâ.* The only exception is said to be the arms of Jerusalem, which were given to Godfrey of Bouillon, which are *argent, a cross potence or, between four crosslets of the same.* Apparent exceptions to this rule in common blazon are—1. Abatements or marks of cadency or difference, labels, crescents, batons, and the like; and 2. Extremities or adjuncts to animals, or other objects, such as tongues, claws, horns, &c.; but neither of these are regarded as independent bearings. Colours and metals, when engraved, are generally indicated by dots and lines: *or*, gold, by dots; *argent*, silver, is left plain; *gules*, red, is indicated by perpendicular lines from top to bottom; *azure*, blue, by horizontal lines from side to side; *sable*, black, by horizontal and perpendicular lines crossing each other; *vert*, by diagonal lines from right to left; *purpure*, by diagonal lines from left to right; *tenne*, by diagonal lines from left to right, crossed by horizontal lines; and *sanguine*, by lines crossing diagonally from left to right, and from right to left.

**CO'LOUR-BLI'NDNESS**, a term introduced by Sir David Brewster to denominate a defect of vision, owing to which certain persons are either unable to discern a single colour, such as red, or to distinguish between two colours, such as green and red, so that they may be said to be blind to red, or to be blind to one of two colours presented simultaneously to the eye. This defect has been called *chromatopseudopsis*—i. e., false vision of colours; Daltonism, after Dalton the chemist, who suffered under it; and various other learned names, have been applied to it; but C. seems to be as apt and expressive a name as any. It occurs in eyes whose power of vision, as to form and distance, is otherwise perfect. The late Dr George Wilson, whose work on this subject should be consulted by the reader (*Researches on Colour-blindness*, Edin. 1855), thus classifies the varieties of the defect: 1. Inability to discern any colour properly so called, so that black and white—i. e., light and shade—are the only variations of tint perceived. 2. Inability to discriminate between the nicer shades of the more composite colours, such as browns, grays, and neutral tints. 3. Inability to distinguish between the primary colours, red, blue, and yellow, or between these and the secondary and tertiary colours, such as green, purple, orange, and brown. The first sort would appear to be very rare, but well-marked cases of it are on record, and shew that insensibility to colours is not only compatible with distinct vision in other respects, but is frequently attended by a greater power than is usual of perceiving objects very faintly illuminated. None of these recorded cases, however, have been examined with such care as to warrant the conclusion, that the C. was absolute. It would appear that where the C. is nearly absolute, degrees of luminosity supply the place of shades of colour in giving variety to the aspects of objects. The second variety of C., where the nicer shades of the more composite colours are mistaken, would appear to be very common—the rule rather than the exception in the majority of persons, at least of the male sex, in this country; but it is a matter of doubt how far it may not be referable to imperfect cultivation of the sense of colour. In many cases of this kind, however, it can be shewn that the defect differs in degree only from that of the third form. The third form is the most important variety of the affection. In extreme cases, although colours are occasionally quite correctly named, there is no certainty as to any colour: in less severe cases, two colours, at least, as red and green, and generally four, as red, green, olive, and brown, are not distinguished from each other. Yellow would appear to be the colour which gives least difficulty to those not absolutely unconscious of colour; while blue, if pure and well illuminated, is readily recognised by the colour-blind, a few of whom, indeed, describe it as the colour which they see best. Red appears to be the colour the want of the sense of which may be said to characterise all the colour-blind. Indeed, Dr Wilson thinks C. might properly enough be called *Anerythric* (No-red) vision. He says that while the normal eye analyses white light into three coloured elements, one of which is *red*, the colour-blind eye, on the other hand, analyses white light into two elements, neither of which is red.

C. would appear to be very prevalent. Of 1154 persons, of various professions, examined in 1852 and 1853 at Edinburgh by Dr George Wilson, 65, or 1 in 17·7, were colour-blind; 21 confounded red with green; 19 confounded brown with green; and 25 confounded blue with green. In consequence of this prevalence of the defect, the investigations into its nature are of the greatest practical importance. Railway officials, for instance, should always be tested for it, lest, being colour-blind, they should mistake the various signals in use on lines of rail, and thus cause accidents. It appears that in a large class of cases, the defect may be palliated by the use of a species of spectacle invented by Professor J. C. Maxwell.

The subject of C. has for some time past received much attention from savans. Sir David Brewster, Sir John Herschel, Professor Maxwell, and many others, have written on the subject. Perhaps the most ingenious investigator of C., and the phenomena of vision generally, is Professor Maxwell, whose writings thereon in the Transactions of the Royal Societies of London and Edinburgh, will well repay perusal.

**COLOURING**, as a musical term, is applied to those passages and harmonic progressions in bravura airs affording the singer an opportunity of display. It is also applied to all grand harmonic combinations in orchestral compositions.

**CO'LOUR-PRI'NTING.** See Polychrome Printing.

**COLOURS**, The Diatonic Scale of. Sir Isaac Newton, when investigating the properties of light, discovered that the lengths of the spaces occupied in the Spectrum (q. v.) by the seven so-called primary C., exactly correspond to the lengths of chords that sound the seven notes in the diatonic scale of music. Hence the phrase, *the diatonic scale of colours.*

**COLOURS**, Military, are certain kinds of flags carried with the army. Standards, banners, pennons, guidons, pencils, ensigns, colours—all are military flags, each originally having a distinct meaning, now to some extent departed from. The ensigns were the original of those which are now called C., and which especially belong to infantry regiments. The C. are square flags, larger than the standards carried by the cavalry. In former times, there was one for each company; but now there are generally two for a whole regiment or a battalion, constituting a 'pair of C.': one of which is called the royal or first, and the other the regimental or second. Both are about 6½ feet by 6, made of silk, with cords and tassels of crimson and gold, and fixed to a staff about 10 feet long. The royal colour or flag is nearly alike for all the regiments; with a blue ground, an imperial crown, the number of the regiment, and the Union Cross of St George, St Andrew, and St Patrick. The regimental C. depends for its tint on the facings of the uniform of the regiment; in its centre is inscribed the number or designation of the regiment; and in the four fields or corners are the badges and honorary distinctions. The senior ensigns carry the C. as a matter of right and honour; and certain non-commissioned officers are set apart as a guard. The C. symbolise the good name and fame of the regiment, and are on that account protected in action with sedulous care; a victor always counts among his achievements the number of C. captured from the enemy. When a regiment obtains new C., they are usually given by the wife of the colonel, or by some other lady of distinction. The presentation is made with much military pomp; and the chaplain of the regiment reads a prayer prepared for the occasion. The Lancaster herald, at the Heralds' College, is 'inspector of regimental colours.'

Besides the 'pair of C.,' there are *camp* C. about 18 inches square, of the same tint as the facings of the regiment, and fixed to a pole about 7 feet long.

**CO'LOUR-SE'RGEANT**, in the Army, is a non-commissioned officer of higher rank and better pay than the ordinary sergeants. There is one to each company of infantry; and the office is specially given to meritorious soldiers. The C. wears an honorary badge over the Chevron (q. v.), and receives 2*s.* 4*d.* per day. He fulfils the ordinary regimental and company duties of sergeant; but in addition to these, he attends the colours in the field, or in the front of a camp, or near headquarters in a garrison. A C. may be degraded to the rank of sergeant for misbehaviour, but only by the decision of a court-martial.

**CO'LT-PIXY.** See Water-kelpie.

**CO'LT'S-FOOT.** See Tussilago.

**COLT'S REVO'LVER.** See Pistol, Revolver.

**CO'LUBER**, a genus of serpents which, as defined by Linnæus, included an extremely miscellaneous assemblage of species, venomous and not venomous, agreeing only in the character of having a double row of plates on the under side of the tail. The venomous species are now excluded, not only from the genus C., but from the family *Colubridæ*, of which it is the type. The serpents of this family are very numerous: it includes, indeed, about one-half of all the known serpents in the world. Their geographic distribution is very wide, although they chiefly abound in the tropics. Some of them are terrestrial, and some arboreal in their habits, the latter chiefly natives of the tropical parts of Asia and America. A few are inhabitants of fresh waters, and feed on fish. They are active in the pursuit of their prey, some of them feeding chiefly on small birds and quadrupeds, some on insects. They do not kill their prey by constriction, like the boas. Some of them are singularly and brilliantly coloured. A few, particularly of the arboreal species, are remarkable for their extremely lengthened form. None of them grow to a very large size. To this family belong the common Ringed Snake (*Natrix torquata*) of England, the only British species. To the genus *C.* belong the Black Snake (q. v.) of America, and the Serpent of Æsculapius (*C. Esculapii*), figured by the ancients as an attribute of their god of medicine. It is of a brownish colour, and attains the length of four or five feet. It is found in the centre and south of Europe, is easily tamed, and exhibits the greatest gentleness of manners.

**COLU'GO.** See Flying Lemur.

**COLU'MBA**, St (called also St Colum-cille and St Colm), one of the greatest names in the early ecclesiastical history of the British Isles, was born (it is believed, at Gartan, in the county of Donegal) in the north of Ireland, on the 7th of December 521. His father, Fedhlimidh, of the powerful tribe of the Cinel Conaill, was a kinsman of more than one chief or prince then reigning in Ireland and in the west of Scotland; and his mother, Eithne, was also of royal descent. To this distinguished parentage, no doubt, he owed some measure of his great influence upon the minds of his countrymen.

He studied first at Moville, at the head of Strangford Lough, under St Finnian, by whom he was ordained a deacon; and afterwards under another St Finnian, at Clonard, where he was ordained a priest. Among his fellow-disciples, he is supposed to have had St Comgall, St Ciaran, and St Cainnech; and so conspicuous was his youthful devotion, even in that saintly company, that he received the name by which he is perhaps still best known in Ireland—'Colum-cille,' or 'Columba of the Church.' In 546, when no more than twenty-five, he founded Derry, and, six or seven years afterwards, Durrow, the greatest of all his Irish monasteries. He seems now to have embroiled himself in the civil strifes of his country; and the belief that he instigated the bloody battle of Cooldrevny, in 561, led to his excommunication by an Irish ecclesiastical synod. The justice of the sentence was challenged by ecclesiastics of rank, but it was probably among the causes which determined him to leave Ireland.

It was in 563, when in his 42d year, that, accompanied by twelve disciples, he set sail for the little island of Hy or Ioua, as it was then called—now better known as Iona (q. v.), or I Colum-cille—of which he obtained a grant, as well from the king of the Picts as from his kinsman the king of the Scots. Having planted a monastery here—built, it would seem, chiefly of wattles—he set himself to the great work of his life, the conversion of the Pictish tribes beyond the Grampians. The Picts dwelling to the south of that mountain barrier had been converted by St Ninian of Whithern, in the 5th c.; and the Scots who peopled the western shores and islands of Scotland, were either Christians before they passed over from Ireland, or were afterwards converted by Irish missionaries. St C. now brought the Picts of the north to the true faith; but, unfortunately, very little is known of the way in which he accomplished his task. Bede speaks simply of his 'preaching and example.' Adamnan, extolling his gift of miracles, tells how the gates of the Pictish king's fort burst open at his approach, and how, as he chanted the 45th Psalm, his voice was preternaturally strengthened, so as to be heard like a thunder-peal above the din and clamour by which the Pictish magicians tried to silence his evening-prayer under the walls of the Pictish palace. We get another glimpse of his missionary footsteps from the *Book of Deer*, a Celtic MS. of the 11th or 12th c., lately discovered at Cambridge. It records how 'Colum-cille and Drostan, the son of Cosreg, his disciple, came from Hy, as God had shewn them, to Aberdour' (a beautiful little bay among the huge cliffs which fringe the coast of Buchan, as the north-east district of Aberdeenshire is still called); how 'Bede, a Pict, was then high steward of Buchan, and gave them that town in freedom for evermore;' how 'they came after that to another town, and it was pleasing to Colum-cille, for that it was full of God's grace; and he asked of the high-steward, Bede, that he would give it to him, but he gave it not; and, behold, a son of his took an illness, and he was all but dead, and the high-steward went to entreat the clerics that they would make prayer for his son, that health might come to him; and he gave in offering to them from Cloch-in-Tiprat to Cloch-Pette-mic-Garnait; and they made the prayer, and health came to him.' In some such way as this, St C. and his disciples seem to have traversed the Pictish mainland, the Western Islands, and the Orkneys, establishing humble monasteries, whose inmates ministered to the religious wants of the people. The parent-house of Iona exercised supremacy not only over all these monasteries, but over all the monasteries which St C. had built in Ireland, and over those which were founded by his disciples in the northern provinces of England when they converted the Angles and the Saxons. Thirty-four years appear to have been spent by St C. in raising up and perfecting his ecclesiastical system in Scotland. But the labour did not so wholly engross him, but that he found time for repeated voyages to Ireland, and for a visit to Glasgow, where St Kentigern or Mungo was restoring Christianity among the Welsh or British tribes of Cumbria and Strathclyde. The health of St C. seems to have begun to fail in 593, but his life was prolonged till he reached his 77th year, when he breathed his last as he knelt before the altar of his church in Iona, a little after midnight, between the 8th and 9th of June 597. He was buried within the precinct of his monastery, and his bones—which were afterwards enshrined—the stone pillow on which he slept, his books, his pastoral staff, and other things which he had loved or used, were long held in great veneration. No composition certainly known to be his has been preserved; but there have been attributed to him three Latin hymns of some merit, a short monastic (or rather heremitical) rule in Celtic, and several Celtic poems, among which is a collection of his prophecies.

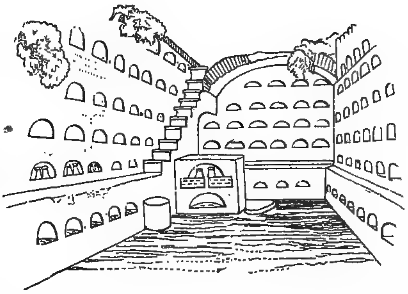
The strength of St C.'s character appears to have been in its earnestness. There is no reason to think that he was reputed either wiser or more learned than the better class of the ecclesiastics of his age. But the same enthusiastic temper which won for him in boyhood the name of 'Columba of the Church,' continued to animate him throughout life. The length and frequency of his fasts and vigils are spoken of as nearly incredible. With this asceticism he combined unwearied industry; no hour passed without its allotted duty of prayer, or reading, or transcribing, or other work. As the prevailing austerity of his disposition was often lighted up by gleams of tenderness and kindness, so it appears to have been clouded at times by anger and revenge. 'But whatever sort of person he was himself,' wrote Bede, in allusion probably to these infirmities, 'this we know of him for certain, that he left after him successors eminent for their strict continence, divine love, and exact discipline; men who follow, indeed, doubtful cycles in their computation of the great festival [i. e., Easter], because, in that far out of the world abode of theirs, none had ever communicated to them the synodal decrees relating to the paschal observance, but yet, withal, men diligently observing those works of piety and chastity, and those only, which they were able to learn from the writings of the prophets, evangelists, and apostles.'

The ecclesiastical system of St C. was in so far peculiar that, in the words of Bede, Iona 'had always for its ruler a presbyter abbot, to whose jurisdiction both the entire province, and the bishops themselves also, contrary to the usual order of things, must own subjection, after the example of that first teacher of theirs, who was no bishop, but a presbyter and monk.' The jurisdiction usually reserved to the episcopate was thus transferred to the abbatial office; little more being left to the bishop than the right of ordination, and a certain measure of precedence in the celebration of divine service. St C. himself, as well as his followers generally, till the year 716, kept Easter on a different day, and shaved their heads after another fashion, than obtained in other parts of Western Christendom. But, with these exceptions, their creed and rites appear to have been substantially the same.

The life of St C. was written by two of his successors in the abbacy of Iona—Cuimine Ailbe (657—669) and St Adamnan (679—704). The first of these lives is incorporated in the second, which is altogether one of the most valuable works now extant on the early ecclesiastical history of Scotland and Ireland. It has gone through many editions; the last, and incomparably the best—a book, indeed, beyond praise—being that of the learned and laborious William Reeves, D.D., Vicar of Lusk, printed at Dublin in 1857 for the Bannatyne Club and the Irish Archæological and Celtic Society. Besides his *Vita Sancti Columbae*, Adamnan wrote *De Locis Sanctis*, an interesting account of Jerusalem and its neighbourhood, from the information of a French bishop, who, in returning from the Holy Land, was driven among the Western Isles of Scotland. This tract has been more than once printed, and its chief passages were transcribed by Bede in his *Historia Ecclesiastica Gentis Anglorum*. We learn from it that waxed tablets for writing were in use among the disciples of St C. in Iona, at the close of the 7th century.

**CO'LUMBAN**, or **COLUMBA'NUS**, St, one of the most learned and eloquent of the many missionaries whom Ireland sent forth to the continent during the Dark Ages, was born in Leinster about the year 545. Having studied under St Comgall, in the great monastery of Bangor, in Ulster, he passed over to France, in his 45th year, accompanied by twelve companions, and founded the monasteries of Annegray, Luxeuil, and Fontaine. His adherence to the Irish rule for calculating Easter involved him in controversy with the French bishops about 602; and a few years later, the courage with which he rebuked the vices of the Burgundian court, led to his expulsion from France. Passing through Switzerland into Lombardy, he founded, in 612, the famous monastery of Bobbio, in the Apennines, where he died on the 21st November 615. His life, written, within a century after his death, by Jonas, one of his successors in the abbacy of Bobbio, has been repeatedly printed. The writings of St C., which are wholly in Latin, consist of a rule for the government of his monastery, a few poems, several letters on ecclesiastical affairs, and sixteen short sermons. His monastic rule has been printed more than once; but the most complete edition of his works is in Fleming's *Collectanea Sacra*, published at Louvaine in 1667, and now of such rarity that a copy of it sells for about £35. Of the sermons of St C., M. Guizot remarks, that 'the flights of imagination, the pious transports, the rigorous application of principles, the warfare declared against all vain or hypocritical compromise, give to the words of the preacher that passionate authority which may not always and surely reform the soul of his hearers, but which dominates over them, and, for some time at least, exercises paramount sway over their conduct and their life.' The town of San Colombano, in Lombardy, takes its name from the Irish monk, as the town and canton of St Gall (q. v.), in Switzerland, perpetuate the name of the most favoured of his disciples.

**COLUMBA'RIUM** (Lat.), a dove-cot or pigeon-house. When used in the singular, C. also signified a particular kind of sepulchral-chamber used by the Romans to receive the ashes of bodies which had been burned. The name was derived from the chamber being surrounded by small niches or holes resembling the holes in a dove-cot (Columbaria) in which the urns (*ollæ*) were deposited. Tombs of this description were chiefly used by great families for depositing the ashes of their slaves and dependants. Several of them are still to be seen at Rome. The annexed wood-cut (copied from Smith's *Dictionary of Greek and Roman Antiquities*) represents a very perfect one which was discovered at the Villa Rufini, about two miles beyond the Porta Pia, in 1822. In each niche were two urns, with the names of the persons whose ashes they contained inscribed over them.



**COLU'MBIA**, the federal district of the United States, and the seat of the general government, lies on the left bank of the Potomac, being territorially within the limits of Maryland. The district contains about 60 square miles—its chief cities being Washington, the capital of the Union, and Georgetown. In 1850, the population numbered 51,687, of whom 3687 were slaves. It is a singular, but apparently unavoidable anomaly, that this, the centre, as it were, of a purely democratic republic, has neither part nor lot in the authority to which it is subject. It sends no member to congress, being in this respect less favourably situated than the *Territories*, which do return delegates to speak, if not to vote. C., in short, has taxation without representation.

**COLUMBIA**, or O'REGON, a name long applied to the entire region extending, on the west side of the Rocky Mountains, between California and Russian America. This region comprised, even on the mainland, a great deal more than the basin of the river from which it derived its appellation; while it included the almost continuous breast-work of islands from the Strait of Fuca to lat. 54° 40′ N. After having been held, or at least claimed, about half a century, in common, first by Spain and England, and then by England and the United States, it was, within these last 20 years, divided between the latter two powers by the parallel of 49° N. and the Strait of Fuca. Since that time, it has expanded from a wilderness, which had barely a nucleus of civilisation on the Wallamette, a southern feeder of the Lower Columbia, into two American communities—the state of Oregon and the territory of Washington; and two English colonies—Vancouver's Island and British Columbia.

**COLUMBIA**, or OREGON, the largest stream on the west side of America, rises in the Rocky Mountains, draining that range by means of its different head-waters, from about lat. 54° N. to about lat. 42° N. Its two main branches—the C. Proper from the north-north-east, and the Snake from the south-east—meet about lat. 46° 5′ N., long. 118° 55′ W., and united, run together to long. 124° 5′ W., where they empty themselves into the Pacific in a latitude corresponding with that in which they joined. This great river, long vaguely believed to exist, was discovered only in 1792, by Captain Gray of Boston in Massachusetts, who gave it the name of his own vessel in place of the floating appellations of the Oregon and the San Roque. The extreme length cannot be less than 1000 miles; most of its course—all, in fact, but the upper part of the north branch—being within the limits of the United States. Nevertheless, the entire navigation is equally open to the British and to the Americans. That navigation, however, is of comparatively little value, more particularly to the former nation. The river is broken by falls and rapids into many separate portions; and of these, even the lowest and most important, the maritime reach itself, does not exceed 90 miles in length. In addition to the inland impediments, the ingress and egress are embarrassed by a surf-beaten bar, which, with few and precarious passages, extends from Cape Disappointment on the north, to Point Adams on the south. Still, as a harbour, the C. has the recommendation of being decidedly the best on the coast between San Francisco, which is nearly 600 miles to the south, and Port Discovery, which is fully 150 miles to the north.

**COLU'MBIA**, BRITISH, the youngest of England's colonies, is situated in lat. 49°—55° N., long. 115°—132° W., and measures about 420 miles in breadth by 300 in length, its total area being estimated at upwards of 120,000 square miles. Its northern limit, as settled by act of parliament in 1858, follows the Simpson River to the Pacific Ocean on the west, and the Finlay, an affluent of the Peace, to the Rocky Mountains on the east. Running parallel with the chain on the east border, which itself rises, in Mount Brown, to a height of 16,000 feet, two ranges divide the width of the country into three sections of drainage. Of those three sections, again, the outer two are subdivided into different basins by spurs, which connect the west range with the sea, and the east one with the backbone of the continent. In the east are head-waters, which find opposite outlets in the estuaries of the Columbia and of the Mackenzie; through the entire middle and part of the east, the Fraser maintains a southerly course, till, at Fort Hope, it is bent sharply to the right by a mountain barrier, so as to enter the Gulf of Georgia barely within the international boundary; and lastly, across the west, a series of streams, generally meeting long and narrow inlets of the ocean, increase in magnitude as one advances to the north—a series terminating in the Skeena, which, with its upland reservoir, Babine Lake, of 100 miles in length, is but little inferior to the Fraser itself. Most of the rivers exhibit one or other of two conflicting peculiarities—they either inundate the soil, or do not water it at all. The channels are chiefly deep ravines, the province, as a whole, being singularly rugged and lofty; but wherever the immediate banks sink or recede, the summer torrent, swollen by the melting of the winter-snows, is apt to flood the comparatively level margin of its ordinary bed. Though the climate, at any given height, is far less hyperborean in winter than in the corresponding belt on the eastern shore of the New World, yet actually, on account of the vastly superior general elevation, the difference appears to be by no means conspicuous. Beyond lat. 50°, frost and snow reign during nearly half the year; nay, within lat. 49½°, the mountains to the east of Fort Hope are rendered impassable for at least seven months by snow-drifts of 25 or 30 feet in depth. Even in summer, the temperature is said to be unprecedentedly variable, having been found to range from 31° to 85°, and again from 85° to 40° in the space of less than 24 hours.

In a region of such physical features, communications must, of course, be equally difficult and expensive. Steamers can ascend the Fraser to Fort Hope, a distance of 100 miles from the coast; and the Harrison, an affluent joining the Fraser from the right, about 37 miles below Fort Hope, is practicable, in summer, for a smaller class of vessels up to Port Douglas, a reach of 45 miles. With this single exception, the inland routes are of the rudest description. Up the left of the Fraser, however, a tolerable road as far as Lytton, at the confluence of the Thompson, is (1861) in course of completion; and, in continuation of the line of the Harrison, an amphibious track of 50 miles for boats, and of 75 for wheels, is sweeping round to strike the Middle Fraser in the vicinity of the remoter gold-fields. But the basin of the Fraser—practically constituting at present the whole of the province—is perhaps, at least in all but its lowest division, more accessible from the west than from the south. That main artery is almost parallel with the coast, which is itself, at many points, brought still nearer by long and narrow inlets; while the intermediate streams, each at the head of its own salt loch, seem to offer a choice of shorter and easier passages into the interior. Every known route, excepting, of course, the Fraser proper up to Fort Hope, is, in general, far less practicable in winter than in summer.

For nearly half a century before being drawn within the pale of civilisation, British C. had largely yielded, more especially to the Hudson's Bay Company, skins of various kinds, salmon of excellent quality, and timber of magnificent proportions. Beyond a garden, or here and there the semblance of a farm, little or nothing had been done for the cultivation of the soil. Nor has agriculture even now, notwithstanding the extravagant premiums held out to it, made much progress. In most parts of the colony, the arable surface, scanty, as a whole, at best, often amounts, in single spots, only to infinitesimal patches, and those probably liable to inundation. Grazing-ground appears to be more abundant, especially on the

Middle Fraser, and on the nearer affluents of the Columbia. But, as the command of water-power everywhere affords unusual facilities for lumbering, more land will doubtless be gradually rendered available both for pasturage and for tillage. The grand obstacle, however, in the way of all such improvements, centres in the more attractive character of mining than of any more regular pursuit. Independently of silver, which has been discovered in the lower basin of the Fraser, and of copper, which is known to exist immediately to the east of the same, gold may be said to be universally diffused. The 'diggings,' dry or wet, according as they are above or below the high-water mark, are embarrassed by two contrary difficulties: such as are wet can be wrought only in the autumn, after the floods have subsided, and before the frosts have set in; the dry ones, again, almost everywhere suffer, more or less, from the want of the means of washing. There is reason to believe that most of the gold which has hitherto been collected has been swept down by floods from nature's magazines in the mountains; nay, the process may be regarded as still going on, for rich deposits are often so near the surface as to indicate a very recent formation. In addition to gold, silver, and copper, abundance of coal and iron likewise exists.

To its mineral resources, British C. mainly owes its present position. It was the discovery of gold in 1857—coinciding as it did with the expiration of the Hudson's Bay Company's licensed monopoly —that led to the establishment of the colony in 1858. In connection with this same cause, adventurers from the United States, from Great Britain and its dependencies, and even from China, have flocked to this land of promise. But, according to an apparently universal law, the aborigines have suffered from the influx of races superior to themselves. In this instance, however, they have themselves chiefly to blame. Preferring the 'diggings' to the hunting and fishing, which were sure to supply them with both food and raiment, they have perished, in a considerable proportion, by famine and disease. To state the number of inhabitants, if it were possible, would be unsatisfactory and delusive. Till agriculture shall have taken root, and spread forth branches, there can scarcely be said to be, in the proper sense of the word, any population at all. Beyond the towns, or rather villages—purely mercantile appendages of the diggings—the extrinsic sojourners, restless and fluctuating in summer, disappear altogether during winter. Representative institutions having, under such circumstances, been as yet an impossibility, the governor of British C., who is also governor of Vancouver's Island, unites in his own person both legislative and executive functions—being subject only to the *ex post facto* control of the Colonial Secretary. For judicial purposes, there is a supreme tribunal, which goes the circuit; while local courts exercise a jurisdiction in cases of debt up to £50. The province is, moreover, a diocese of the Church of England; and the bishop, who has eight or ten clergymen under him, has planted missions among the Indians and the Chinese immigrants.—The chief town and port is New Westminster on the Fraser.

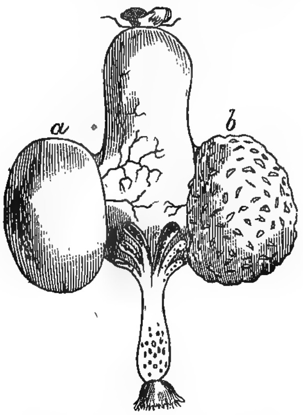
During 1859, the *exportation* of gold, as distinguished from its *production*, is officially estimated at £14,000 a month, or £168,000 in all.

In the same year the imports were as follows:

| | | | |
|---|---|---|---|
| Down to 31st March, | £35,022 | 6 | 10 |
| " 30th June, | 49,551 | 2 | 5 |
| " 30th September, | 41,569 | 12 | 0 |
| " 31st December, | 51,076 | 6 | 2 |
| | £177,219 | 7 | 5 |

The revenue, being in the aggregate £50,000 for the twelve months, arose almost entirely from three sources—the customs, the sale of building-lots, and a transit-duty of 12*s.* a ton on all goods forwarded to the interior from New Westminster. For later information, see FRASER RIVER.

**COLU'MBIDÆ**, a family of birds, often comprehended under the general English names *dove* and *pigeon*, and forming the genus *Columba* (Lat. pigeon) of Linnæus. They are generally ranked among gallinaceous birds, but exhibit points of resemblance to the order *Insessores*, and have by some naturalists been constituted into a distinct order, intermediate between these. They agree with the true gallinaceous birds in the character of their bill, and in the soft naked tumid membrane at the base of it, in which the nostrils are pierced; also in their *rasorial* (scraping) habits and blunt claws; but they differ very widely from them in their great powers of flight, which are not surpassed in any other family of birds; in having the hind-toe on the same level with the other toes; in having no connecting membrane at the base of the toes; in not being polygamous but pairing, and in the male taking part with the female in the care of the young; in their having generally only two young ones at a time, but breeding often in a year; in their double crop, an expansion of the gullet on both sides, in which they differ from all other birds; and in the secretion, at breeding-time, of a milky fluid by the crop of both parents, as in the parrots, with which the food is saturated in order to fit it for the young, which, unlike those of the true gallinaceous birds, are at first very helpless. The figure represents the gullet and double crop of a pigeon—one side, *a*, exhibiting the usual appearance of the crop; and the other, *b*, shewing its appearance when the glands are developed which secrete the milky fluid. The number of species of C. is very great. There is amongst them so much resemblance, that scientific classification has been found very difficult. They are found in all warm and temperate climates, but comparatively few are European. The Indian archipelago particularly abounds in them. Many of the tropical species exhibit a brilliancy of colours scarcely excelled in the humming-birds or sun-birds. The chaste beauty of the plumage is always pleasing, even when brilliancy is wanting. The voice is very similar in all the species, the *cooing* of some, however, being harsh, that of others soft and pleasant. Some species are migratory, and some congregate in prodigious flocks. See BRONZEWING, CARRIER PIGEON, DOVE, FRUIT PIGEON, GOURA, GROUND-DOVE,



Gullet and Double Crop of a Pigeon.

Partridge Pigeon, Passenger Pigeon, Pigeon, Turtle-dove, and Vinago.

**CO'LUMBINE** (*Aquilegia*) a genus of plants of the natural order *Ranunculaceæ*, having five coloured sepals, which soon fall off, and five petals each terminating below in a horn-shaped spur or nectary. They are natives of the temperate and colder regions of the northern hemisphere. One, the Common C. (*A. vulgaris*), is found in woods in some parts of Britain, and has long been familiar as an inmate of flower-gardens. It is a perennial, generally three or four feet high, with flowers of curious structure and considerable beauty. C. was formerly much esteemed for medicinal virtues, which are now seldom heard of.—Some of the other species are very ornamental, and are pretty common in flower-borders.

Common Columbine (*A. vulgaris*).

**COLU'MBIUM, or TA'NTALUM** (symbol Ta), is a rare metal found in the mineral tantalite, obtained from Bodenmais, in Bohemia, and from Sweden. It can be obtained as a black powder, which assumes a lustrous aspect when subjected to the process of burnishing. It forms a series of compounds, of which only Columbic Acid ($TaO_3$) is worthy of notice.

**COLU'MBUS, Christopher** (the Latinised form of the Italian *Colombo*, and the Spanish *Colon*), the great navigator who added a new hemisphere to our globe, is supposed to have been born at or near Genoa, in the year 1436, or, as others say, 1446. Though virtually the greatest man of his era, there is little definite information about his family and his early life. It would appear, however, that he was the son of a wool-comber; that he attended for some little time the then great school of learning in Pavia, where he evinced a taste for astronomy and cosmography; and that he early went to sea, and made several voyages in the Mediterranean. Settling in Lisbon in 1470, he there married the daughter of an Italian named Palestrello, who had distinguished himself as a navigator in the Portuguese service, and with her obtained some valuable charts, journals, and memoranda. Lisbon, at this time, was the head-quarters of all that was speculative and adventurous in the way of geographical discovery; and here, while constructing maps and charts for the livelihood of his family, C. first appears to have imbibed that idea of land to the westward, which he was destined, after long disheartening years, to establish as fact—the land, indeed, not being, as he had supposed it, a prolongation of the eastern shores of Asia, but a new western continent. With the view, apparently, of better qualifying himself for his great enterprise, C. made several voyages to the Azores, the Canaries, and the coast of Guinea—then the limit of European navigation in this direction. Not until about 1482 or 1483, did C. find opportunity to lay his scheme before John II. of Portugal. This monarch referred it to a junto of nautical and scientific men, who decided against it. The king, however, meanly taking advantage of a detailed plan obtained from C. under false pretences, secretly sent out a vessel to examine the route. Too timid to venture far from the beaten-track, the pilots soon returned to Lisbon, to throw ridicule on the project. Disgusted with the duplicity of his sovereign, C. secretly left Lisbon in 1484, taking with him his little motherless boy Diego. He found his way to Genoa, where the republic, before whom he unfolded his scheme, treated it as the silly product of a visionary brain; and it is said that he also met with like treatment from the Venetians; but it appears doubtful whether he at this time communicated with them. Disappointed, but not despairing, for C. was buoyed up with the belief that Heaven had commissioned him to plant the banner of the cross upon those shores which as yet appeared to exist but in his own imagination, C. turned his steps towards Spain. Weary and hungry, he stopped one day at the gate of the Franciscan convent La Rabida, in Andalusia, to beg some bread and water for his child. This day was the turning-point in his career. The superior of the convent, Juan Perez de Marchena, passing at the moment, entered into conversation with the traveller, and was so struck with the grandeur of his views, that he used all his influence to procure him the favourable consideration of the king and queen. It was not, however, until seven more years of disappointments had passed over—during which C. had applied to other courts, and without avail—that he found himself in command of three small vessels, only one of which was decked, with 120 men, ready to start on his adventurous enterprise. C. claimed, as reward, to be nominated high-admiral, and governor-general and viceroy, over all the lands he discovered, with a tenth of the produce of the countries. On the 3d of August 1492, C. set sail from the bar of Saltes, near Palos. Delaying a month at the Canaries to refit, he started thence, on the 6th of September, over unknown seas. His crew soon began to interpose their timid fears, and when these were unavailing, to express their open disaffection; but equally disregardful of both, C. bore steadily westward; himself, however, not without misgiving as to what the variation in the needle (not before discovered) portended. On the 12th of October, his perseverance was rewarded with the sight of land, which proved to be one of the Bahama Islands. Here he solemnly planted the cross, giving the island the name of San Salvador. After discovering several other of the West India Islands, including Cuba and Hayti, or San Domingo, at the latter of which, called by him Hispaniola, he settled a small colony, C. set sail again for Spain, where he arrived on the 15th March 1493, and was received with every demonstration of joy and admiration, as well by the people as the court. In September of the same year, he set sail from Cadiz on a second expedition, with 17 ships and 1500 men. In this voyage, he discovered the Caribbee Islands, Jamaica, &c.; but calumnies at home forced him to return in 1496. Having cleared himself with his sovereigns, he, in 1498, set out on a third expedition. This time, steering more to the southward, he discovered

Trinidad, and the mouths of the Orinoco, and landed at Paria, on the coast of South America. After these discoveries, C. steered for Hispaniola, where he found everything in disorder. The king's ear had been again abused; an officer named Bovadilla had been appointed to supersede C. as governor, and by this person C. was sent home in chains. This unworthy treatment excited the indignation of the Spanish people to such a degree, that Ferdinand was fain to disavow all knowledge of the disgraceful affair. But all C.'s efforts to obtain redress from the king were fruitless. The spirit of adventure, however, which had borne him up amid so many disappointments, was not to be crushed by injustice. It still burned bright and strong as ever within the great old man, who, on the 9th May 1502, with four vessels and 150 men, set out once more to seek a passage uniting the Atlantic and Pacific oceans, which he imagined lay somewhere between Honduras and Paria. But the mutinous character of his crew forced him aside to seek for gold, and after many difficulties and disasters, and having added little of importance to his previous discoveries, he returned to Spain in November 1504. Isabella was dead; Ferdinand proved basely ungrateful; and so the noblest navigator the world has seen, was permitted to die in poverty at Valladolid, 20th May 1506. To make up somewhat for his injustice, Ferdinand gave C. a pompous funeral, and erected a magnificent monument to his memory, as if 'Honour's voice' could

> 'Provoke the silent dust,
> Or flattery soothe the dull cold ear of Death.'

Biography furnishes no parallel to the life of C.; great men there have been who have met with disappointments and injustice, but there is perhaps no other instance of a great man whom disappointments and injustice did not dishearten and disgust; who had his greatness recognised in his lifetime, and yet was robbed of the emoluments it entitled him to; and who, after death, had the honour he had so hardly won conferred upon another. See Amerigo Vespucci.

**COLUME'LLA.**—1. The central axis which remains, formed of the placentas, when the carpels of some fruits have separated from each other and from them.—2. The central axis of the spore-cases (capsules) of mosses.—3. The central axis around which the whorls of many spiral univalve shells are closely wound.

**COLUMELLA**, Lucius Junius Moderatus, the most learned of Roman writers on practical agriculture, was born at Cadiz, in Spain, and flourished in the earlier part of the 1st c. of the Christian era. For some time, he resided in Syria, but lived chiefly at Rome, and died, most probably, at Tarentum. His great work, *De Re Rustica*, in 12 books—the 10th, On Gardening, is versified—is addressed to one Publius Silvinus, and treats of arable and pasture lands, culture of vines, olives, &c., care of domestic animals, &c., respective duties of masters and servants, &c. A supplementary treatise relates to trees. This ancient 'Book of the Farm' is written in good Latin, and the information is copious, though not precise, and in some points of questionable accuracy. The best editions of C. are by Gesner (1735 and 1773) and Schneider (1794—1797).

**CO'LUMN** (Lat. *columna*), a pillar or post, usually cylindrical in form, employed for the purpose of supporting a roof, entablature, or other superstructure. As the earliest habitations in almost all countries were formed of wood, it is unquestionable that the earliest columns consisted of the trunks of trees. It is said that even at the present day the Greek peasants of Asia Minor construct their wood-huts so as almost exactly to resemble the form and disposition of parts which we find in the great architectural monuments of classical antiquity. That the Greeks actually made use of wood in the earliest time, even for their monumental structures, we learn on the testimony of Pausanias, who mentions a monument in the market-place at Elis which consisted of a roof supported by pillars of oak; and Pliny tells us that the temple of Juno at Metapontum was supported by pillars made of the stems of vines. From these facts, it is natural to conclude that the stone columns which came first into use would be imitations of the trunks of trees; and this we are also in a condition to prove historically, many of the largest stone columns in Egypt—where, from the scarcity of wood, they were earlier introduced than elsewhere—being manifest imitations of the trunk of the palm (figs. 2 and 3). In order to prevent them from being forced into the ground by the superincumbent weight, these early wooden columns were placed upon one or more large flat stones, and on the top another stone was placed, to preserve them from the decay which the rain sinking into the wood would have occasioned. In these primitive arrangements, we plainly perceive the germ of the three principal parts of the classical C.—the shaft, the base, and the capital. As the Doric style of architecture was the earliest of the classical styles, the Doric is naturally the simplest and most severe of the classical columns. One of its most striking peculiarities is what at first sight seems to be the absence of the base (fig. 4). The true account of the matter, however, is, that all the columns in the same line of a Doric temple stand on one base, whereas, in the other orders, each C. has a separate base. But it is in the capitals in all the orders, Egyptian, Classical, and Gothic, that columns differ from each other most strikingly (see below). As classical architecture advanced, greater lightness and elegance were sought after; and this, as regarded the C., was obtained by increasing the height, and diminishing the proportional thickness of the shaft. In the Ionic and Corinthian orders (figs. 5 and 6), as compared with the Doric, this peculiarity may be distinctly seen.

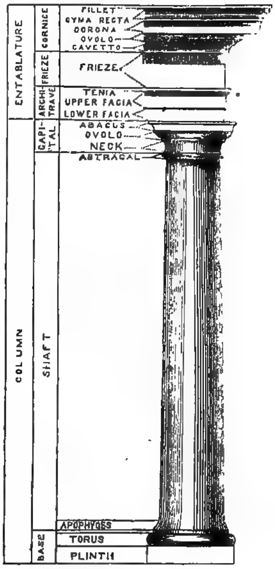


Fig. 1.—Column: Tuscan, with details.

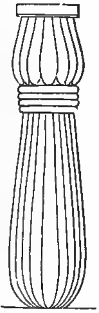


Fig. 2.

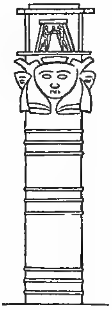


Fig. 3.

In almost all columns, the shaft tapers gradually from the bottom to the top, thus imitating the natural growth of a tree, and at the same time conforming to a mechanical rule for obtaining the greatest amount of strength in upright bodies. But in place of tapering regularly, the shaft was generally made with a slight swelling towards the middle, called the *entasis*, and had for the most part in all the classical orders striped incisions from top to bottom called Flutes or Channels (q. v.). These flutes were regularly worked, and varied in number from 20 to 32. The relation which subsisted between the height of the C., and the diameter at the top and bottom, and between these and the entablature, has been calculated with the greatest possible precision in all the principal classical examples, and will be found stated in all professional works on classical architecture. The shaft usually consisted of several cylindrical blocks accurately fitted to one another, whilst the capital was commonly hewn out of a single stone. The separate portions of the shaft were fixed together, not by mortar or cement, but by iron cramps, which were fitted into holes in the centre, and thus rendered invisible. Sometimes columns of immense size were hewn in the quarry of one piece of stone, and then rolled over the ground, and raised to their destined positions by various mechanical contrivances. Columns were often used in classical times, and are employed by us in the interior of buildings to support the roof or galleries, as well as for purposes of decoration; and this custom seems to have prevailed in the halls of persons of great distinction even in Homeric times. In the ancient Basilica (q. v.), a line of columns separated the central space which was open to the sky from the aisles of the building, whilst at the same time they supported the galleries which were placed above the aisles. These columns were the origin of the piers or pillars by which the nave is divided from the aisles in Christian churches. The same arrangement prevailed in the Roman atrium. When, in order to support the roof which covered the gallery or any other superstructure, a second row of columns was introduced, it was usually of the lighter styles, Ionic or Corinthian, the lower columns being commonly Doric. Single columns were erected for various purposes, as for mooring ships in harbours, or to commemorate persons of note, or national events. See PILLAR.

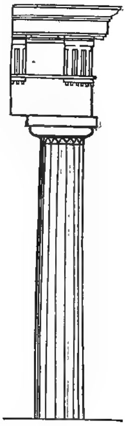


Fig. 4.

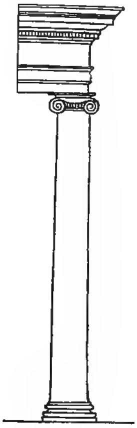


Fig. 5.

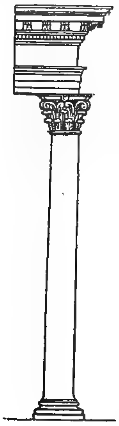


Fig. 6.

*Capitals.*—In classical architecture, it is by the capitals of pillars, more than by any other feature, that the different orders are distinguished, very much as the Gothic styles are marked by the form of the arch. Till the period of the renaissance, the head of a column, in English, was called chapiter (chapter), its diminutive being chapitrell. The three capitals which alone belong to pure Greek architecture are described in Thomson's well known lines (*Liberty*), so concisely and accurately, that it is needless to dwell on them in prose :

> 'First unadorned,
> And nobly plain, the manly Doric rose ;
> The Ionic then, with decent matron grace,
> Her airy pillar heaved ; luxuriant last,
> The rich Corinthian spread her wanton wreath.'

To the three Greek orders, the Romans added two others : the Tuscan, which was a variation on the Doric, or rather a corruption of it; and the Composite, which was a combination of the Ionic and Corinthian, the proportions and general character of the Corinthian being retained, but the Ionic volutes being substituted for the Corinthian leafage. As the trunks of trees placed upright, so as to support the roof, unquestionably led to the introduction of the stone pillar, there seems to be almost as little doubt that the capital was suggested by the boughs with which such trees might be supposed to be surmounted, or the garlands with which, on festive occasions, they were probably encircled and crowned. At first, when the power of working in stone was limited, imitation of foliage was scarcely attempted; but the original idea being adhered to, it came at last to be carried out with great success in the Ionic and Corinthian capitals of classical architecture, and in all of the more advanced of the Gothic styles.

The forms of Gothic capitals are so various, that it is altogether impossible to particularise them here. Beginning with the Romanic—which is often nothing more than a modification of the Doric, or a further debasement of the Tuscan, the sides being truncated or flattened, and some of the mouldings omitted—they advance very rapidly in adornment; and in the style which we call Early English, they already frequently consist of a mass of foliage, cut with great boldness and freedom, so that the stalks and more prominent of the leafage are entirely detached. It is remarkable that, in the decorated style, the capital lost much of the richness which it possessed in the earlier styles, and often consists only of plain mouldings, with or without a ball-flower (q. v.), cut on the bell or bowl of the capital. Where foliation is introduced in this style, it is usually worked with greater freedom, and is free from the stiffness which characterises earlier work. Animals, figures in armour, heads of bishops in mitres, and the like, are oftener found in the decorated style, though their introduction was not unknown at a much earlier period. In the perpendicular style, the capitals were stiffer in form, and generally less ornamented than in any of the others; though even here foliage is often introduced, as in the accompanying example from the cloisters of Christ Church, Oxford.

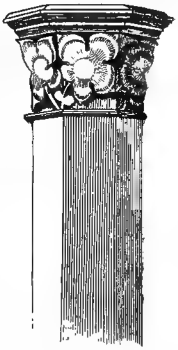


Fig. 7.

The only invariable characteristics of capitals seem to be something like a moulding at the upper part of the shaft, more or less complicated according to circumstances. and some sort of Abacus (q. v.) or flat portion on the top, on which the architrave rested in the classical orders. These characters belong even to the Egyptian capitals, which in many other respects resemble those of the other styles. The foliation of Egyptian capitals is generally taken from the vegetation peculiar to the banks of the Nile (fig. 2); but the capitals of this, particularly in its later examples, were infinitely varied both in decoration and in form.

**COLUMN**, in Military Evolutions, is a mass of soldiers several ranks in depth, presenting a formation different from that which arises from spreading them out *in line*. There may be columns of brigades, of regiments, of battalions, or of companies; presenting a front of limited width, but a depth depending on the number of elements in the column. If a battalion consists of ten companies, then a 'battalion in C.' has all the companies posted one behind another. According to the density of the C., it is called *open* or *close*. In a battalion, when the distance between any one company and the one immediately before it is such as to admit of their wheeling into line, the formation is called *open* C.; when the distance between the front rank of one company and the rear rank of the one before it is only a few yards, it is *close* C.; when intermediate between these two, it is *half-distance* column. The relative advantages of C. and *line*, in drawing up troops for action, are among the matters closely studied by the commanders of armies: the French, as a general rule, have rather favoured the formation in C.; the English, that in line. Sometimes the name C. is given to that which, in effect, is a small army.

**CO'LURE.** See ARMILLARY SPHERE.

**COLU'TËA.** See SENNA.

**COLY'MBIDÆ**, a family of web-footed birds, distinguished by short wings, legs placed so far back that the bird always assumes an erect position when standing, broad flat tarsi (*shanks*), and a compressed bill, pointed at the tip. They are all extremely aquatic in their habits, and possess great powers of diving as well as of swimming. Some of them have all the front toes perfectly webbed, as the loons or divers (*Colymbus*); others have the feet lobed, each toe with a separate membrane, as the grebes (*Podiceps*). These are the two principal genera. The guillemots (*Uria*) seem to connect this family with the *Alcadæ*.

**CO'LZA.** See RAPE.

**CO'MA**, a Greek word used in medicine, to signify a state of more or less profound insensibility allied to sleep, but differing from natural sleep in its characters, as well as in the circumstances under which it occurs. In C., the patient lies on his back, and is either simply insensible to external impressions, or has a confused and dull perception of them, with restlessness and low Delirium (q. v.). The former kind of C. occurs in apoplexy and epilepsy, and also in many other organic diseases of the brain and its membranes, of which, indeed, it may be said to be the natural termination. It is also seen in narcotic poisoning, and most characteristically in poisoning by Opium (q. v.). In the most fatal forms, the breathing is very slow and noisy (snoring or stertorous), accompanied with puffing of the cheeks; the pulse is at first strong and regular, afterwards feeble; there is often lividity; and the pupils are either contracted or excessively dilated, but in either case immovable, and totally insensible to light. In the second variety of C., there is perpetual restless delirium, without enough of sensibility to lead to spontaneous and regular voluntary movements; the patient mutters slightly, and grasps feebly and without purpose at any object in his way; the pupils are commonly contracted, and the tongue is apt to be dry and brown. This kind of C. is mainly seen in many fevers, and forms one of the modes of their fatal termination. The treatment of C. is that of the disease or accident leading to it. Where there is a reasonable chance of recovery, the patient must be roused to consciousness as much as possible, either by frequent movements or strong impressions on the skin, or by the use of galvanism, so as to maintain the respiration. See OPIUM, POISONING BY. Blistering of the head is also sometimes resorted to with good effect.

**CO'MA BERENI'CES** (Lat. Berenice's hair), a small and close cluster of stars near the equinoctial colure, south of the tail of the Great Bear.

**COMA'CCHIO**, a fortified town of Central Italy, 3 miles from the Adriatic, and 28 miles east-south-east of Ferrara. The lagoon or marsh, in the midst of which it is situated, is about 140 miles in circumference, and is shut out from the Adriatic by a narrow belt of mud. Its position is very favourable for the manufacture of salt, of which 2,000,000 lbs. are said to be obtained annually. C. is also the seat of a curious branch of industry—viz., eel culture, which forms the principal employment of its inhabitants, who number about 6000. A series of canals have been constructed leading from the Adriatic to admit the fry of the eel, the mullet, the sole, and other fishes into the lagoon, where they are fattened, and speedily attain a marketable value. The fishery is carried on chiefly in the late autumn, when the waters of the lagoon are excited by storms. The fish, then seeking an outlet to the sea, find their way into certain labyrinths leading into reservoirs constructed at the termination of the canals, where they are caught in immense quantities. Religious ceremonies inaugurate the commencement of the season, and when any body of fishermen in one night capture 48,000 lbs. weight of fish, a feast of fish is held, and great rejoicings take place. The eel-harvest occupies from twelve to fifteen weeks; and some idea of its extent may be formed from the fact, that from the years 1798 to 1813 the annual 'take' averaged close upon 2,000,000 lbs. weight. From 1813 to 1825, the average was about 1,612,600 lbs. per annum. An accident for some years greatly reduced these quantities, but the supply is again increasing, being now close upon a million pounds weight per annum. The fish are prepared for the market by partial cooking in a large kitchen built for the purpose, the eels of moderate size being roasted alive, in order to their better preservation. The larger fish are chopped into lengths, the heads and tails being sold for the benefit of the poor. Large quantities of the eels are also salted and dried. The workmen, who are lodged in barracks, and submit to a strict discipline, are allowed one and a half pounds of fish per diem. The money-value of these fisheries may be estimated from the fact, that 1 lb. weight of eel-fry will, in the course of three or four years, be worth to the cultivators of the lagoon a sum of £41 sterling.

**COMA'TULA.** See CRINOIDEÆ.

**COMB** (Sax. *camb*). Combs seem to have been used by the ancients rather for adjusting than for fastening the hair, the pin or bodkin (*acus*) having been chiefly employed for the latter purpose. Both the Greek and Roman combs were generally made of boxwood, which was obtained from the shores of the Euxine; but latterly, ivory combs came into general use amongst the Romans, as they had long before been amongst the Egyptians. The precious metals were also used for the purpose, as we may infer from the golden combs ascribed to the goddesses; but this was probably rarer in ancient than in modern and medieval times, from the circumstance of the C. not having been then used as an ornamental fastening. Of the early use of gold combs by our own countrywomen, we have a monument in the well-known ballad of *Sir Patrick Spens:*

> 'O lang, lang may their ladyes sit,
> Wi' their gowd kames in their hair.'

Fig. 1 represents an ancient Irish long rack C. in the museum of the Royal Irish Academy. The sides are hog-backed, and between them are set the pectinated portions, varying in breadth from half an inch to an inch and a quarter, according to the size of the bone out of which they were cut. The whole is fastened together with brass pins riveted. By this contrivance, any damaged portion could easily be replaced.

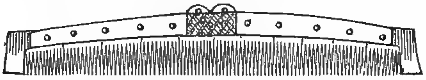


Fig. 1.

Fig. 2 is a specimen of a pocket fine-tooth C., from the same collection; it is drawn two-thirds the size of the original.

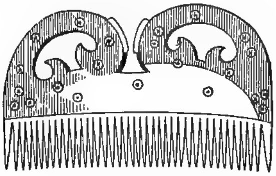


Fig. 2.

Combs are made of tortoise-shell, ivory, horn, wood, bone, metal, and india-rubber. The material is first made into plates of the size, shape, and thickness of the C., and then the teeth are cut. The old method of cutting the teeth is by the *stadda* or double saw, which has two blades of steel set parallel to each other, with a space between them equal to the thickness of the intended tooth. Combs with 50 or 60 teeth to the inch may be cut in this manner. The teeth are then thinned, smoothed, and finished by means of thin wedge-shaped files. Instead of hand-saws, circular-saws of similar construction have been more recently used.

Many combs are now made by a method called 'parting.' By the processes of cutting above described, the material corresponding to the spaces between the teeth is of course wasted; by the method of parting, this is made available to form the teeth of a second comb. The annexed figure will shew how this may be effected. The plate of horn, tortoise-shell, &c., is cut through by means of a stamping-cutter, consisting of two thin chisels inclined to each other, as *ac* and *bd*, which represent their edges; between these, and connecting the ends *c*, *d*, is a small cross-chisel. When this compound cutter descends with sufficient force upon the plate, it will cut one of the teeth shewn in the figure. By simple machinery, the table carrying the plate is made to advance a distance equal to the thickness of one tooth while the cutter is rising, and thus the successive cuts are made as represented. A slight pull is now sufficient to part the plate into two combs, the teeth of which only require filing and finishing.

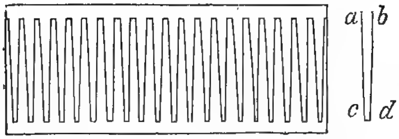


Fig. 3.

India-rubber combs, now so extensively used, are manufactured by pressing the caoutchouc to the required form in moulds, and 'vulcanising' or combining it with sulphur afterwards. By this means a high degree of hardness can be obtained.

**COMB**, or **COOMB**, an old corn-measure, containing four bushels. In many localities, hollows or valleys among hills are called Combs or Coombs (W. *cwm*). The word is allied to the Gr. *kymbos*, a cavity; *kymbe*, a vessel.

**COMBE**, George, a well known phrenologist and moral philosopher, was born October 21, 1788, at Edinburgh, where he was educated. Entering the legal profession, he became a writer to the Signet in 1812, and continued to practise until 1837, when he resolved to devote himself to scientific pursuits, for which he had always manifested a predilection. As early as 1816, he made the acquaintance of Dr Spurzheim, while the latter was on a visit to Scotland, but at first regarded his phrenological system with aversion. Investigation, however, convinced him that phrenology was based on fact. The result was his *Essays on Phrenology* (1819). Five years later, appeared his *System of Phrenology*, which became very popular, and reached a fifth edition in 1853; besides being reprinted in America, and translated into French and German. But his most important production is *The Constitution of Man considered in Relation to External Objects* (1828; 9th ed. 1860). This work endeavours to demonstrate, what it is strange should ever have been denied, the essential harmony of the nature of man with the surrounding world, and the necessity of studying the laws of nature, in order that we may realise the advantages of the external world, lessen our exposure to outward evils, and carry out successfully man's physical, moral, and social improvement. C.'s doctrines were violently opposed, being considered by many as inimical to revealed religion: but now that the heat of controversy has cooled, it is seen that, in their main aspects, they were not liable to the objections urged; and they are, to a large extent, adopted in the physico-social reforms of the present day. Nearly 100,000 copies of the work have been sold in this country; numerous editions have been printed also in America, and it has been translated into French, German, and Swedish. C. contributed largely to the *Phrenological Journal* (20 vols., 1824—1847). He travelled in Germany and America, and published *Notes* of his experiences. His death occurred on 14th August 1858. Mr C. married, in 1833, Cecilia, daughter of the celebrated Mrs Siddons; by whom he is survived. Besides the works mentioned, he wrote *Elements of Phrenology* (1824; 8th ed. 1855); *Lectures on Popular Education* (1833; 3d ed. 1848); *Moral Philosophy* (1840; 3d ed. 1846); *Life and Correspondence of Andrew Combe, M.D.* (1850); *Principles of Criminal Legislation and Prison Discipline* (1854); *Phrenology applied to Painting and Sculpture* (1855); and *The Currency Question considered in Relation to the Bank Restriction Act, 7 and 8 Vict. c. 32* (1855; 8th ed. 1858), &c. The latest of his works—in which the importance of natural religion, and the duty and advantage of obedience to its precepts, are eloquently enforced—is on

*The Relation between Science and Religion* (1857). Endowed with great activity and an earnest apostolic spirit, C. was fond of lecturing on his favourite subjects, and delivered many successful courses not only in various parts of the United Kingdom, but in the United States, and even in Germany. As a citizen, he took a zealous part in promoting parliamentary reform, the abolition of the corn laws, and a system of national education available to every sect on equal terms. His collection of books on phrenology has been deposited in the Advocates' Library in Edinburgh.

**COMBE**, Andrew, M.D., brother of the preceding, was born in Edinburgh, October 27, 1797. He studied medicine there and at Paris, and in 1823 commenced to practise in his native city. In 1836 he received the appointment of physician in ordinary to the king of the Belgians, but his delicate health prevented him from retaining this office; and on returning from Brussels, he continued to act only as consulting-physician to his majesty. Afterwards, he became one of the physicians in ordinary to Queen Victoria in Scotland. He died at Edinburgh, August 9, 1847. His principal works are —*Observations on Mental Derangement* (1831); *The Principles of Physiology applied to the Preservation of Health*, &c. (1834; 15th ed. 1860); *The Physiology of Digestion considered with Relation to the Principles of Dietetics* (1836; 10th ed. 1860); and *The Management of Infancy, Physiological and Moral* (1840; 9th ed. 1860, revised by Sir James Clark). Mild, benevolent, and wise, Andrew C. obtained the esteem and admiration of all who could appreciate purity and excellence of character. In his *Life and Correspondence*, published by George Combe in 1850, we find not only a vivid picture of the man, but an example of patient adherence to physiological principles in the treatment of a delicate constitution, with the result of prolonging a useful life far beyond what he had ventured to hope for. The record of the means by which he combated a serious pulmonary disease for nearly thirty years at home and abroad, is calculated to be highly instructive to persons similarly afflicted. His death was probably hastened by exposure to the poisonous air of an emigrant ship, in which he made a voyage to America: the experience gained on this occasion led him to proclaim, through the *Times*, the urgent necessity of a law regulating the sanitary arrangements in emigrant vessels. The long letter which he wrote on this subject appeared on September 17, 1847, a month after his death, and ere long the Act 12 and 13 Vict. c. 23, provided a remedy for the evil. Dr C. also exerted himself successfully for the improvement of medical education. A list of his contributions to the *Phrenological Journal* and the *British and Foreign Medical Review* is appended to his *Life*. His character as a man, a physician, and a writer, is affectionately depicted by his friend Sir James Clark, in an Introduction to the 9th edition of *The Management of Infancy*.

**CO'MBERMERE**, Viscount (Stapleton Stapleton-Cotton), a British field-marshal, son of Sir Robert Salusbury Cotton, baronet, of Combermere Abbey, Cheshire, was born in 1773 at Llewenny Hall, Denbighshire. Educated at Westminster School, he, in February 1790, entered the army, and distinguished himself in India at the battle of Mallavelly and the siege of Seringapatam. In 1807 —in which year he succeeded his father in the baronetcy—he proceeded, with the rank of major-general, to the Peninsula, in command of a brigade of cavalry; and in 1810 was appointed to the command of the whole allied cavalry under the Duke of Wellington. He was present at the battles of Talavera, Fuentes de Onore, Salamanca—where he was second in command, and was severely wounded —the Pyrenees, Orthes, and Toulouse. For his brilliant services in the Peninsular War, he repeatedly received the thanks of parliament, and in May 17, 1814, was raised to the peerage as Baron Combermere. Although not at Waterloo, he had the command of the cavalry of the army of occupation in France; and in 1817 was appointed governor of Barbadoes, and commander of the forces in the West Indies. In 1822, he became commander-in-chief in Ireland; and in 1825 was nominated commander of the forces in India. In that position, he achieved the capture of the strong and almost impregnable fortress of Bhurtpore; and, December 2, 1826, was raised to the rank of viscount. In 1834, he was sworn a privy councillor; and in October 1852 succeeded the Duke of Wellington as Constable of the Tower of London and Lord-lieutenant of the Tower Hamlets. In 1855, he was made field-marshal.

**COMBINA'TION** means the act of uniting or combining certain active elements; and it has come lately, in the legal and political phraseology of England, to mean the uniting together of persons having a common interest, with a view to promoting that interest. Thus, it may refer to employers uniting together to keep up prices or keep down wages; or it may apply to workmen uniting together to keep up wages. The word is now almost exclusively used in relation to the proceedings of the working-classes for retaining a monopoly of certain occupations, or for keeping up wages above their natural amount. C. is one of the most obvious, and in certain circumstances, one of the most justifiable and beneficial arrangements. Like all other human institutions, it has its good and bad shape—the former, when it is used for protection; the latter, when it is used for oppression. It is a practical exemplification of the precept taught by the old man in the fable, when he recommended union to his sons by shewing that the bundle of sticks could not be broken, but that each stick could be easily snapped when separated. The municipal corporations were combinations to protect the citizens against the power of the aristocracy, and a group of these municipal corporations formed themselves into a larger C., well known as the Hanse Towns, whose united influence not only braved the aristocracy, but exceeded that of many of the European monarchies. The guilds and other societies, whether of merchants or artisans, were combinations established for protection in violent times; though they were employed to further monopoly and interfere with freedom of trade, when more equal laws, and a higher social civilisation, rendered them unnecessary for mere protection from external oppression. The free-masons are a relic of a great guild, or secret society, pervading all Europe. The similarity to each other of contemporary Gothic buildings, however far apart, is explained by the circumstance, that they were built by a large C. of workmen, who all learned in the same school the same rules of art, and who had secret arrangements which enabled them to work together, and preserve the monopoly of the building-trade.

The oppressive laws to which the working-classes, even in this country, were subjected, fully justified them in combining for their own protection. The nature of those laws is explained, though not justified, by the fact, that they were less oppressive than the institutions of other countries where the working-classes were in actual serfdom; and that they mark, in reality, the steps of progress onwards from the state of slavery or serfdom in which all the working-classes were of old involved, even in this country. The boasted freedom of our Saxon ancestors was, indeed, very similar to that of the southern states of North America at the present day, since it was all enjoyed by the upper class, to whom the inferior persons were slaves; and the term freeman, still used in certain municipalities, of old distinguished those who were not slaves. The statutes of labour still retained a portion of this servitude, laying heavy penalties on workers in the various trades who refused to work at a regular fixed remuneration—often, of course, below the market value, otherwise it would not require to be protected by penalties. By the Poor Law Act, too, those who would not work might be veritably enslaved by being compelled to labour in the service of any householder. It may be said, indeed, to be the last stage of the emancipation of the working-classes from slavery when the C. Act was repealed in 1824. This act, which, after all, was a mild relic of the old laws for coercing workmen, subjected those who, whether verbally or in writing, entered into combinations for keeping up the wages of their labour, or limiting the hours of work, to be punished by imprisonment as criminals. There is no doubt that, in defiance of this act, secret combinations were held of a more dangerous and cruel character than any which have occurred since the repealing act of 1824, which rendered C. itself lawful, but punished any attempts to enforce the views of the combining workmen by violence or intimidation.

Both by the law of the land, and the public opinion on which it rests, it is now allowable for any class of men to combine together for the purpose of fixing the price at which they shall buy or at which they shall sell, provided their C. be entirely voluntary, and subject no one to coercion. All the landlords of a state, for instance, might combine to keep up the price of grain; but if they should get a law to enable them to exact this price by prohibiting any of their body from selling for less, or for prohibiting or limiting the importation of foreign grain, then their C. would be oppressive. In like manner, a hundred bricklayers or a hundred tailors may combine not to work for less than a certain remuneration, or not to work more than a certain number of hours daily; and they are quite free to do so, provided they do not coerce any one to join their C., or do not interfere with those who are content to work on lower terms. The difficulty is to discover coercion. When there is actual assault, or the threat of violence, the matter is clear; but a formidable C. spreads terror without actually inflicting or threatening violence, by a tacit understanding that it *will* be inflicted, if needful. It may be proved, for instance, as in the case of the great strike by the London building workmen in 1859—1860, that a workman coming from the country to fulfil an engagement, is met at the station when he arrives by a deputation of the unionists, who accompany him to a tavern, and never lose sight of him until they have made him one of their body—there can seldom be a doubt that such a person is intimidated, though it is difficult to prove that he did not yield to moral persuasion.

Though free combinations among the working-classes are legal, their policy as a matter of self-interest is very questionable. It is only by means of that coercion which must be avoided, that they can ever succeed in counteracting the law of supply and demand; and every attempt to do so, ends in calamitous results to themselves. The unvarying history of combinations to raise wages, is either that new hands are brought in, who drive the combining workmen out of the market, or that the capital and the trade find their way to some other place where production is free. The occasion when workmen combine is generally the operation of some cause reducing their position, and the C. in the end only aggravates the pressure downwards. For instance, the cause of the great building-strike already referred to, was, that workmen were too numerous—the trade was overstocked. To meet the depressing effect of this, they resolved, while keeping up their old wages, to give an hour less of work in return, thinking that the supernumerary hands would be employed to make up the deficiency in the supply of labour. On the contrary, workmen were brought from a distance to supply the place of the men who struck, and these finding the surplus of labour against which they were struggling aggravated, had to content themselves with filling up the vacancies so created in the country labour-market, or by less remunerative occupations; and this after they had undergone a course of privations which caused much mortality among themselves and their families. The same result followed the great colliery C. of 1844, when the men, because they were 40,000 strong, thought they could carry all before them. After terrible sufferings, they returned to the pits, only to find that others occupied their places. The evils of combinations, of course, spread beyond the mere workmen concerned, but it is on these and their families that they fall heaviest. The predictions that combinations would drive our staple manufactures to other countries, and destroy our productive pre-eminence, have not been verified. On the contrary, the resources to which employers have been driven by combinations have opened new paths of enterprise, and have had a special influence in advancing machinery, by prompting inventions to supersede hand-labour.

**COMBINATION, Laws of**, in Chemistry. See Atomic Theory.

**COMBINATIONS**, in Mathematics. See Permutations.

**COMBING**, of wool, cotton, &c. See Carding.

**COMBRETA'CEÆ**, a natural order of exogenous plants, consisting of trees and shrubs, all natives of tropical countries. It contains about 200 known species, most of which are characterised by astringency.

**COMBU'STION** is the term applied to the process of burning, which usually consists in the oxygen of the air uniting with the constituents of the combustible substance. Thus, the C. of coal is due to the oxygen of the air passing into a state of chemical union with the carbon and the hydrogen of the coal, forming carbonic acid ($CO_2$) and water-vapour (HO). Such chemical combinations are always accompanied by the production of more or less heat, as in the case of decaying wood and other vegetable matter; but it is only when the action is so rapid as to evolve intense heat accompanied by light, that the process is called burning or combustion. Though the gaseous oxygen has as much to do with the process as the more solid material, coal, wood, paper, or cloth, yet the latter is alone styled the *combustible* or *burning body*, whilst the oxygen is invariably named the *supporter* of combustion. A few substances burn at ordinary temperatures, such as phosphorus, which glows when exposed to the air; but the generality of substances, such as wood, coal, &c., require to be raised in temperature or be set fire to before they possess the power of combining with the oxygen of the air. The amount of heat given out by the various combustibles when burned, is capable of being measured, and is definite. The same weight of the same combustible invariably evolves the same amount of heat during its complete

C.; but different combustible substances give off different amounts of heat. The mode in which the heat evolved may be measured, is either (1.) To observe the quantity of ice which a given weight of the combustible will melt when burning; (2.) To notice the weight of water which the combustible will convert into steam; or (3.) To estimate the number of pounds of water which the burning body will raise from 32° to 212° F. The last plan is the more easily managed and accurate, and serves as the index in the following table, which gives the number of pounds of water raised from 32° to 212° F. during the C. of one pound of each of the burning bodies:

| | | |
|---|---|---|
| Charcoal, pure, . | 78 | lbs. of water. |
| 〃 from wood, . . | 75 | 〃 |
| Wood, dried, . . | 36 | 〃 |
| 〃 undried, . . | 27 | 〃 |
| Coal, bituminous, . . | 60 | 〃 |
| Turf and Peat, . . . | 25 to 30 | 〃 |
| Alcohol, . . . | 67½ | 〃 |
| Olive oil, wax, &c., . . | 90 to 95 | 〃 |
| Ether, . . . | 80 | 〃 |
| Hydrogen, . . . | 236½ | 〃 |

The amount of heat evolved appears, however, to be proportional to the quantity of oxygen required to burn the various combustibles. Thus, when a similar volume of oxygen gas, or even ordinary air, is allowed to flow against the various combustible substances, the following results are obtained:

| One lb. oxygen combining with | Raises from 32 to 212 degrees F. |
|---|---|
| Hydrogen, . . | 29½ lbs. of water. |
| Charcoal, . . . . | 29 〃 |
| Ether, . . . . | 28 〃 |
| Alcohol, . . . . | 28½ 〃 |

While the absolute amount of heat evolved during the C. of any burning body is the same, yet the sensible heat may vary according to the rapidity of the process. Thus, when phosphorus is exposed to the air at ordinary temperatures, it very slowly combines with oxygen, and gives out little heat at any one moment, but it is diffused over a great length of time; whilst if the phosphorus is set fire to in the air, it burns vividly, and gives out much heat and light for a short time; and still further, if the burning phosphorus be placed in pure oxygen, it enters into most vivid C., and evolves a most intense heat and brilliant light for a still shorter time. In the latter instances, the heat evolved at any one moment is greater, because more rapid, than that given off at the same time during the slower process of C.; but when allowed to proceed to a termination, there is as much heat produced during the whole time occupied in its development. The same remark applies to the coal placed in a furnace. So long as the door of the furnace is open, and there is little draft of air through the fuel, a moderate amount of heat is evolved, which may last for several hours; but when the door is shut, and much air is drawn through the coal, the latter is more quickly burned, and more heat is evolved during a shorter period of time than before, but in the long-run there is the same amount of heat evolved.

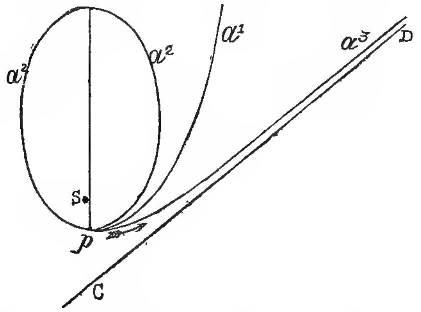
**CO'MEDY.** See Drama.

**COMENIUS**, John Amos, the most distinguished educational reformer of the early part of the 17th c., was born on the 28th of March 1592, according to some, at Comna, near Brünn; according to others, at Niwnitz, in Moravia. His parents belonged to the community of the Moravian Brethren. C. studied at Herborn, and then at Heidelberg, after which he travelled through Holland and England, and at last settled at Lissa, in Poland, where he was chosen bishop of the Moravian Brethren. In 1631, he published his *Janua Linguarum Reserata*, which was translated into many European, and even into some Oriental languages. In this work, he points out a method of learning languages new at that time, which may be called the intuitive or perceptive system, in which the pupils were taught by a series of lessons on subjects easily understood or appreciable by the senses—such as natural history, the sciences, different trades and professions, &c. C. also published about the same time the *Ratio Disciplinæ Ordinisque Ecclesiæ in Unitate Fratrum Bohemorum* (1632), republished with remarks by Buddæus (Halle, 1702); and his *Pansophiæ Prodromus* (1639). In 1641, C. was invited to England, to assist in reforming the system of public instruction; but as the breaking out of the civil war prevented the execution of this design, he went to Sweden, where he was patronised by Oxenstiern, who gave him a commission to draw up a plan for the organisation of schools in Sweden, which he completed at Elbing, four years afterwards. He next went to Hungary for a similar purpose. Here he composed his celebrated *Orbis Sensualium Pictus*, or The Visible World (Nürn. 1658), the first picture-book for children, which has been often reprinted and imitated. Finally, he settled in Amsterdam, where he published several other works. C. died at Naarden on the 15th October 1671. In the latter years of his life, C. gave way to fanaticism, misinterpreted the Revelation of St John to suit his fancies of the existing state of Europe, and expected the millennium in 1672. An interesting account of the wanderings and sufferings of C., and of his great services in the cause of popular education, is given in K. G. von Raumer's *Geschichte der Pädagogik*.

**CO'MES**, an ancient officer, with territorial jurisdiction. See Earl.

**CO'MET.** The word C. is derived from the Gr. *kómē*, hair, a title which had its origin in the hairy appearance often exhibited by the haze or luminous vapour, the presence of which is at first sight the most striking characteristic of the celestial bodies called by this name. The general features of a C. are—a definite point or nucleus, a nebulous light surrounding the nucleus, and a luminous train preceding or following the nucleus. Anciently, when the train preceded the nucleus—as is the case when a C. has passed its perihelion, and recedes from the sun—it was called the beard, being only termed the tail when seen following the nucleus as the sun is approached. This distinction has disappeared from all modern astronomical works, and the latter name is given to the appendage, whatever its apparent position. Neither this luminous attendant, the tail, nor the nucleus, is now considered an essential cometary element, but all bodies are classed as comets which have a motion of their own, and describe orbits of an extremely elongated form. There are several plain points of difference between comets and planets. The planets move in the same direction, from west to east, which is astronomically called 'direct motion;' but the movements of comets are often from east to west, or retrograde. The orbits of all the planets are confined to a zone of no great breadth on either side of the ecliptic; but the paths of comets cut the ecliptic in every direction, some being even perpendicular to it. The orbits of all the planets are nearly circular; or, more properly speaking, are ellipses of very small eccentricity. The orbits of comets, on the other hand, present every variety of eccentricity, some of them being ellipses or elongated closed orbits of various degrees of elongation; others, hyperbolas; while the majority have a form of orbit not differing sensibly from the parabola, which is the limiting form of curve to which both the ellipse and hyperbola approximate, under given conditions.

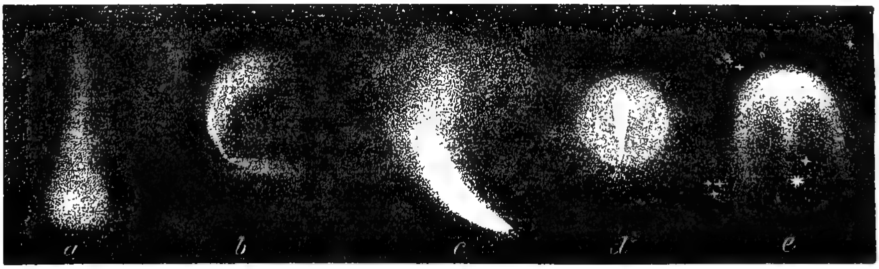
Let $p$ be the point of perihelion passage of a C., and let the direction of its motion be in the direction indicated by the arrow. There is a certain velocity of motion at this point which would give the orbit the form of a parabola, $pa^1$, the direction of motion always approached to being parallel with the straight line through $p$S. Any velocity less than this would cause it to describe a closed curve $pa^2a^2$; any greater velocity would cause it to describe the hyperbola $pa^3$, in which case it would approximate to the direction of the straight line CD, and would never return. This would be the case if there were no disturbing force to interfere with the sun's attraction; and conversely, comets approaching the sun along the various paths above described, would pass the perihelion with the various velocities above indicated. Any attraction, however, of an extraneous body interfering with the attraction of the sun might change the orbit from the ellipse to the hyperbola, and *vice versâ*, or from the parabola to either. As, however, there is only one parabola corresponding to infinite sets of ellipses and hyperbolas, an interfering cause is not likely to change the orbit from an ellipse or hyperbola to the parabolic form. Of about 200 comets whose orbits have been obtained with more or less accuracy, 40 appear to have described ellipses, 7 hyperbolas, and 150 orbits that cannot be distinguished from parabolas.



The discovery that comets are celestial bodies, extraneous to our atmosphere, is due to Tycho Brahé, who ascertained the fact by observations of the C. of 1557. Newton succeeded in demonstrating that they are guided in their movements by the same principle which controls the planets in their orbits; and Halley was the first, by determining the parabolic elements of a number of comets from the recorded observations, to identify the C. of 1682 with one which had been observed in 1607 and the observations recorded by Kepler and Longomontanus, and also with a C. observed in 1531 by Apian, at Ingoldstadt, and thus confidently to predict the return, at the end of 1758 or beginning of 1759, of a C. which would have the same parabolic elements. These parabolic elements are elements of a parabola nearly coincident with the elongated elliptic orbit of the comet. They are—1. *The Inclination.* 2. *The longitude of the node.* These two determine the plane of the orbit. 3. The longitude of the *perihelion*, or point of nearest approach to the sun. 4. The perihelion distance, or nearness of approach to the sun. 5. The direction of motion, whether *direct* or *retrograde.*

To determine these parabolic elements, three observations of the C. are sufficient; and by a table of such elements deduced from the recorded observations, it is possible at once to ascertain whether any newly observed C. is identical with any that have been previously observed. To predict, however, with accuracy the time of the return of a C., a much more accurate calculation must be made of the orbit, taking into account the perturbations of the planets to whose influence it is subject. This difficult problem was solved, in the case of Halley's C., by the joint work of Laland, Madame Lepante, and Clairaut, who announced, in November 1758, just as astronomers began to look out for the return of the C., that it would take 618 days more to return to the perihelion than on the preceding revolution. The perihelion passage was fixed about the middle of April 1759; but Clairaut distinctly forewarned the world that, being pressed for time, he had neglected small values, which collectively might amount to about a month in the seventy-six years. The C. passed the perihelion on the 12th March 1759, exactly a month before the time announced, but within the assigned limits of divergence from that date. The elements of its orbit proclaimed it to be the C. of the former periods by their similarity. For the next perihelion passage, the different calculations executed by MM. Damoiseau and De Pontécoulant, fixed the 4th, the 7th, and the 13th November 1835. Subsequently, observations indicated the 16th—that is to say, a deviation of only three days from what turned out the most accurate calculation, and a deviation of 12 days from the most remote. We have adverted to the perihelion passages of this C. in 1531, 1607, 1682, 1759, and 1835. It is also now identified with a C. observed in 1456, and one in 1378, recorded by Chinese observations. There are no sufficiently reliable European observations previous to 1456, but it is conjectured by Arago, that this C. is the same with the C. of 1305; that of 1230; a C. mentioned in 1006 by Hali Ben Rodoan; that of 885; finally, a C. seen in the year 52 before our era.

This account of Halley's C. has been given at length, to illustrate the principles on which the calculations are made. The annexed wood-cut represents some of the appearances which that C. presented, in different parts of its orbit, on its last visit in 1835—*a*, *b*, *c*, in approaching the sun; *d*, *e*, in retreating. There are three other comets whose periodicity is established, and whose paths are accurately known.



1. That of Encke, with a short period of 1204 days. Its orbit does not extend so far as the orbit of Jupiter, and a slight acceleration in its periodic times of return has suggested the possibility of the space, within our solar system at least, being occupied by a resisting medium, though of extreme rarity.

2. That of Biela or Gambart, having a period of six years and three-quarters. During the visit of this C., in 1846, it was seen to separate into two distinct comets, which kept moving side by side till they disappeared. On the return of the C. in the autumn of 1852, the distance between the two nuclei had much increased, and their divorcement is now considered complete.

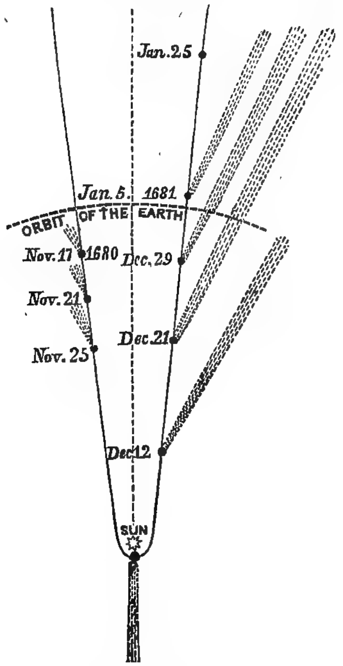
3. That of Faye, with a period of seven years and a half.

The orbits of both these last extend beyond the orbit of Jupiter, but not so far as that of Saturn.

The above are the only comets whose orbits are considered by astronomers as established, although there are others whose orbits are ascertained with a less degree of accuracy and certainty, requiring the test of future returns to fix their periodicity. One other deserves mention from the great peculiarities of its course.

In the month of June 1770, Messier discovered a C. which remained visible a long time, and enabled Lexell to ascertain the orbit to be an ellipse whose major axis was only three times the diameter of the earth's orbit, and corresponded to a periodic revolution of 5½ years. This result suggested grave difficulties. It had been found impossible to identify this C. with any previously observed, and yet it was difficult to conceive that a bright C., with so short a period of return, should have previously escaped observation. What was still more remarkable, it was never seen again, though anxiously looked for in the places where Lexell's orbit would have brought it. It became popularly called Lexell's lost C., and gave occasion to many sarcasms by the wits of the day at the expense of astronomers, who had so much boasted of having found the key to the cometary movements. In the present day, the explanation is complete. The C. was never seen before 1770, because its orbit previously had been totally different, its nearest point to the sun having been as distant as the path of Jupiter. Its appearance that year arose out of the fact, that in 1767 it was in such close contact with Jupiter, moving in the same direction, and nearly in the same plane, that the attraction of this planet entirely changed its orbit. But why has the C. not since been seen? Its passage to the point of perihelion in 1776 took place by day; and in 1779, before another return, it again encountered the vast body of Jupiter, and suffered a fresh orbital derangement, the attraction of the planet deflecting it into more distant regions, and so changing the form of the orbit, that if it had again been visible, it would not have been recognised as identical with Lexell's comet.

The celebrated C. of 1680, which furnished Newton with the occasion for proving that comets revolve around the sun in conic sections, and that, consequently, they are retained in their orbits by the same force as that which regulates the movements of the planets, appears to have been about the most remarkable for brilliancy of any of which we have authentic accounts. This C. is supposed to be identical with the one that appeared about the time of Cæsar's death (44 B. C.), with that which was seen in the reign of Justinian in the year 531, and with another in the year 1106, in the reign of Henry II., the period of revolution, according to the orbit calculated for it by Whiston, being about 575 years. There is, however, some doubt among astronomers as to the real form of its orbit, the one assigned to it by Encke giving it a period of 8813 years. This C. approached nearer to the sun than any known, except perhaps the C. of 1843, the calculation of whose perihelion distance, from the paucity of observations, has little certainty. The C. of 1680 approached the sun within the 163d of the semi-diameter of the earth's orbit. The annexed diagram shews a part of its path; the same diagram shews the direction of the tail. This is nearly always away from the sun, frequently assuming a curved form. It increases in length with its proximity to the sun, but does not acquire its greatest length till after passing the perihelion. These are usual characteristics of comets, which were exemplified by this one in a remarkable degree. These phenomena might be accounted for if we were to regard the train as vaporisation produced by the intense heat to which the body of the C. is exposed in its approach to the sun.

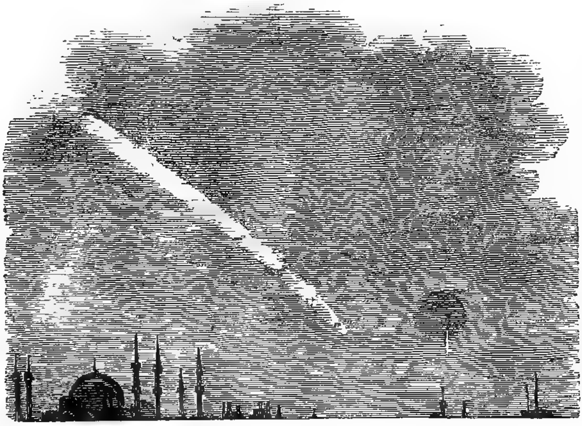


In the present century, the comets most remarkable for brilliancy have been the C. of 1811, that of 1843, and that of 1858 (Donati's).

It has been a subject of question whether comets are self-luminous, or merely reflect the light of the sun. The fact of their becoming invisible in receding from the sun, though still of considerable apparent size, strongly leads to the adoption of the latter hypothesis. Experiments were made by Arago, which shewed that the light from comets is partially polarised, in the same way that the sun's light is reflected by our own atmosphere, which strongly corroborates the same belief.

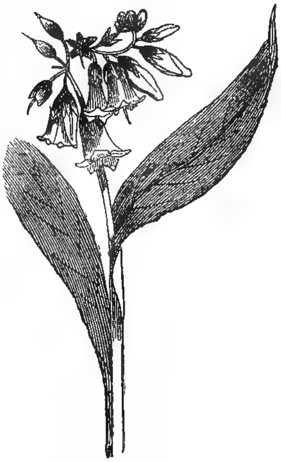
What the matter of the comets consists of is, of course, only a subject for speculation. The composition of the nebulosity and the tail is, at all events, something of almost inconceivable tenuity, as shewn by three considerations. 1. Stars seen through them suffer no diminution of brightness, though the light must have to traverse sometimes millions of miles of the cometary atmosphere. 2. Though the thickness of the tail of a C. may be millions of miles, and its length of course much greater, the comets have never been observed to cause any sensible disturbance of the planetary motions, though approaching near enough to be themselves so much affected as to change the entire character of the orbit. 3. The curvature of the tails, and the acceleration of the periodic time, in the case of Encke's C., indicate their being affected by a resisting medium, which has never been observed to have the slightest influence on the planetary periods, though so long observed. Even the nuclei of comets appear to be of extremely small density. This may be inferred, though with less force than regards the tails, from the two last considerations above mentioned; and, moreover, there are reliable accounts of stars of a very low order of magnitude being seen through the nuclei themselves.

Comets have been alternately regarded with terror and with welcome in the popular mind. The appearance of Halley's C., in 1456, just as the Turks had become masters of Constantinople, and threatened an advance into Europe, was regarded by Christendom with a superstitious dread, and to the Ave Maria was added the prayer: 'Lord save us from the devil, the Turk, and the comet.' At Constantinople, the occurrence of a lunar eclipse at the same time, increased the portentousness of the event. The discoveries of science of the magnitude of the space filled by their bodies, and their prodigious velocity, together with the confessed impossibility of always predicting their approach, produced fears of another kind, which have sometimes been, especially in France, extravagantly exaggerated in the public mind. The groundlessness of such alarms, from the extreme improbability of collision with the nucleus, the probable innocuousness of a contact with the extremely attenuated surrounding matter, and, possibly, to the greater part of the world, of a collision with the nucleus itself, will be sufficiently evident from what has been said above. It is probable that already, on many occasions, some of the attenuated vapour in the tail of comets must have come within the earth's attraction, and been absorbed in its atmosphere. Whether the effect is deleterious or salubrious, or whether it has any perceptible influence at all, is only matter of speculation. The salubrity of cometary influence is now a popular idea; and the vintages of 1811 and 1858 were favourable seasons, whose produce is often advertised as the C. wines. It is scarcely worth while, however, to follow further speculation on these subjects, and it has been considered preferable to confine this article chiefly to the description of the general characteristics of comets, and the facts respecting them afforded by science.



Appearance of Halley's Comet at Constantinople in 1456.

**CO'MFREY** (*Symphytum*), a genus of plants of the natural order *Boragineæ*, distinguished by a 5-cleft or 5-partite calyx, and a corolla enlarged upwards, its throat closed by awl-shaped scales. The species, which are not numerous, are natives of Europe and the north of Asia. They are perennial plants of coarse appearance, although occasionally to be seen in flower-borders. *S. officinale* (the Common C.) and *S. tuberosum* are natives of Britain, frequent in shady and moist places. *S. officinale* was formerly much esteemed as a vulnerary, on account of its astringency. Its young leaves and its blanched shoots are also occasionally used as boiled vegetables. The Prickly C. (*S. asperrimum*), a native of Siberia, 6—10 feet in height, has been highly recommended for feeding cattle.



Common Comfrey.

**COMINES, or COMYNES, Philippe de**, Sieur d'Argenton, a French statesman, and the author of some very interesting and valuable *Memoirs*, was born at the castle of Comines, not far from Lille, in 1445. After receiving a careful education, he passed into the court of Burgundy about 1466, and attached himself particularly to Charles the Bold (then Comte de Charolais). In 1472, C., who was anything but punctilious in his notions of honour, entered the service of Louis XI., the rival and enemy of Charles, who immediately covered him with honours, and made him one of his most confidential advisers. He proved himself a very suitable agent for carrying out the designs of the crafty monarch; but after the death of Louis, by his adherence to the party of the Duke of Orleans, C. incurred the displeasure of the government of Anne of Beaujeu, and was sentenced to a forfeiture of a fourth of his estates and to ten years' banishment. This punishment, however, does not seem to have been carried out, for after a few years we find C. again employed in important affairs of diplomacy. Though engaged in the service of Charles VIII. and the Duke of Orleans, afterwards Louis XII., C. failed to win the confidence of these masters. He died at his castle of Argenton, October 17, 1509. C.'s *Memoirs* are admirably written, and afford abundant proof that he possessed a clear, acute, and vigorous mind. He seems to have looked keenly into the heart of every man who crossed him in life, and with cool, severe anatomy, dissects him for the benefit of posterity. The best edition of his *Memoirs* was edited by Lenglet Dufresnoy (4 vols., London, 1747).

**COMI'SO**, a town of Sicily, in the province of Syracuse, about 40 miles west-south-west of the city of that name. It has paper manufactures, and a population stated at about 10,000.

**COMI'TIA** (Lat. *cum*, with or together, and *ire*, to go) were the legal or constitutional meetings of the Roman people, convened by a magistrate, for the purpose of putting a question to the vote. This definition at least comprehends all the C., except the *C. Calata*, where the people were merely present as spectators. There were several kinds of C. (*C. centuriata*, *C. tributa*, &c.) held for different purposes; and according to the mode of constituting the C., the preponderance lay with the patricians or with the plebeians.

**CO'MITY OF NA'TIONS**—more frequently mentioned by its Latin equivalent, *comitas gentium* —is that species of international legal courtesy by which the laws and institutions of one country are recognised and given effect to by those of another. 'In the silence of any positive rule,' says Mr Justice Story, 'affirming, or denying, or restraining the operation of foreign laws, courts of justice presume the tacit adoption of them by their own government, unless they are repugnant to its policy or prejudicial to its interests.' From the existence of so great a number of independent states on the continent of Europe, and of federated states in America, the *comitas gentium* is more called into play in these countries than in our own, and it has consequently been more extensively discussed by their legal writers. See Story's *Conflict of Laws*. See INTERNATIONAL LAW.

**CO'MMA**, in the mathematical study of sound, is applied to two small intervals, which, by comparison and calculation, arise as the difference between the proportions of certain other intervals of the diatonic scale. The larger, but seldomer occurring C. is called the *C. ditonicum*, or the Pythagorean C., being the difference between the true octave, whose ratio is 2 : 1, and the interval which arises when the octave is obtained by tuning a progression of twelve perfect fifths, or arithmetically by adding their values together; by which process it is found that the last sound is greater than the true octave in the proportion of 531,441 to 524,288. The smaller C., *C. syntonum*, or C. of Didymus, is—First, the difference between the large whole tone, the ratio of which is 9 : 8, and the small whole tone 9 : 10, which is found in the compound of these ratios produced by multiplying together respectively their antecedents, 9 and 9, and their consequents, 8 and 10, to be 81 : 80. Second, The difference between the great limma, 27 : 25, and the great half-tone, 15 : 16, which is found by the same process, and then reducing the resulting ratio to its least terms, to be also 81 : 80. Third, The difference between the diesis, 128 : 125, and the diaschisma, 2048 : 2025, which by the same process gives 81 : 80; and lastly, the difference between the *small* limma, 135 : 128, and the small half-tone, 24 : 25, which again gives the proportions 81 : 80. The difference between the *C. ditonicum* and the *C. syntonum* is exactly the *schisma;* therefore, the aggregate of the diaschisma and schisma, if they be added together, is neither more nor less than the syntonic comma. This C., again added to the diaschisma, makes up the diesis, and added to the great half-tone, makes up the great limma. It follows therefore that, practically, two enharmonic tones in perfect tune never differ by a syntonic C., and it is wrong to say that *d* flat is higher than *c* sharp by a C., while the real difference is that of a diesis, 128 : 125. In the equal-tempered scale, these varieties do not exist. The term *syntonic* comes from the Greek, and means equal-sounding.

**COMMANDA'NT**, in Military matters, is a temporary commander, in place of the real chief; such as a captain-commandant, lieutenant-commandant, &c. In foreign armies, the designation is more frequently applied than in the British, especially to the commanders of garrisons.

**COMMA'NDER**, in the British Navy, is an officer next under a captain in rank, but independent of him in office. He is, in effect, the captain of a ship of war under 18 guns, or a sloop of war, or a bomb-vessel. In matters of etiquette, he ranks with a major in the army. There are now (1861) about a hundred commanders in commission, with pay of 16*s*. 6*d*. per day; while there are above 700 commanders on half-pay of 8*s*. or 10*s*. a day.

The duties of a C., on shipboard, are almost exactly like those of a Captain (q. v.).

**COMMANDER-IN-CHIEF** is the highest officer in the British army. The office of the C., technically known as the 'Horse Guards,' comprises the departments of the military secretary, the adjutant-general, and the quartermaster-general, with a staff of about a hundred secretaries, clerks, &c.

The duties of the C. have never yet been clearly defined, as distinguished from those of the cabinet-minister who presides over the War-office. In a general way, the C. is responsible to the crown for the discipline and efficiency of the army, the conduct and capacity of the officers, and the general organisation. He appoints to army commissions, with certain (or rather *un*certain) exceptions; but the more important appointments are not made without the concurrence of the Minister of War. All such appointments as those of Lord Raglan to command in the Crimea in 1854, Sir Colin Campbell in India in 1857, and Sir Hope Grant in China in 1860, were made by the War Minister, in consultation with the other members of the cabinet. In appointments intermediate between these and regimental appointments, some confusion exists between the War-office and the Horse Guards. The Board of Ordnance has already been placed under the control of the War-office, and it is not improbable that a similar transfer of the office of C. will be made.

The C. in India, under the Company's rule, was *de facto* commander of all the troops, Queen's and Company's, European and native. This will be still more the case, in name and in fact, under the new system, consequent on the cessation of the Company's powers.

A *naval* C. is the chief admiral at any port or station.

**COMMANDITE**, SOCIÉTÉ EN, or PARTNERSHIP IN, an expression used for at least two centuries in France, to express a partnership in which one may advance capital without taking charge of the business, or may become a 'sleeping partner,' as it is called in this country. The term owes its origin to the old meaning in the commercial nomenclature of France of the word command, which was applied to one person authorising another to transact business for him. The working partner had a *commande* from him who merely advanced capital. The term has acquired importance of late in political economy, because the law of France could exempt the sleeping partners from responsibility beyond the amount they might agree to be responsible for. On the other hand, by the law of the United Kingdom, down to the passing of the limited liability act, every partner of a company was liable for all its debts. Hence, in the discussions about the question, whether it would be prudent to relax this law, and permit persons to invest money in trading companies without undergoing this responsibility, such companies were called 'partnerships in commandite.'

**COMMELYNA'CEÆ**, a natural order of endogenous plants, consisting of herbaceous plants, with flat, narrow leaves, usually sheathing at the base. The calyx is 3-partite; the petals three, sometimes cohering at the base. The stamens are six, inserted under the ovary, which is 3-celled; the style is single. The fruit is a capsule, with 2—3 cells and 2—3 valves, bursting through the middle of the valves. The seeds are often in pairs, inserted by their whole side on the inner angle of the cell; the embryo lies in a cavity of the albumen. The order contains more than 260 known species, natives chiefly of warm climates; but a few occur in North America. None are European. *Tradescantia Virginica*, or Spider-wort, common in our flower-gardens, is a familiar example of the order. *Commelyna cœlestis* is a fine ornament of our flower-gardens. The treatment is somewhat like that of the dahlia.

**COMME'NDAM.** When a clerk is promoted to a bishopric, all his other preferments become void from the moment of consecration; but a method was devised by which the substantial interest in the living was retained by its being *commended* to the care of a bishop (called the commendatory) by the crown, till a proper pastor should be provided for it. Such a living was called an *ecclesia commendata*, and it was said to be held *in commendam.* The holding on this title might be really temporary for one, two, or three years, or it might be perpetual. By 6 and 7 Will. IV. c. 77, s. 18, it is provided that no ecclesiastical dignity, office, or benefice shall be held in C. by any bishop, unless he shall have held the same when the act passed. —Stephens, iii. 37.

**COMMENDA'TORS**, in Scotland, in Roman Catholic times, were stewards appointed to levy the fruits of a benefice during a vacancy. They were mere trustees; but gradually the pope assumed the power of appointing C. for life, without any obligation to account. 'This was chiefly intended as a cloak for the plurality of benefices, and to evade the canon of the second council of Nice, by which one benefice only was allowed to be given to one and the same churchman; but all commendators were by our law prohibited, even during popery, by 1466, c. 3, except those that should be granted by bishops for a term not exceeding six months.'—*Erskine's Instit.*, vol. i. p. 98, Ivory's edition. See Abbot.

**COMME'NSURABLE.** Two quantities or numbers are said to be commensurable which are of the same kind, and each of which contains a third quantity or number a certain number of times without remainder. See Incommensurable.

**COMME'RCIAL LAW.** See Mercantile Law.

**COMMINA'TION** is from the Lat. *comminor*, to threaten, and is the name given to a penitential service used in the primitive church. In the earliest ages, those who were guilty of grievous and notorious sins were put out of the church, until, on their repentance, and after long trial, they were restored to full communion. It seems that, at least from the beginning of the 8th c., there was an office of this kind for public penitents on the first day of Lent; but from various causes, the penitential discipline became extinct, both in the Eastern and Western Churches, and the office for Ash-Wednesday (so called from the penitents coming clad in sackcloth and ashes) is the only memorial of it left. The office, as used in the Church of England, is nearly the same as those found in the Salisbury and York missals. The curses contained in Deut. xxvii. against impenitent sinners are read, and the congregation answer 'Amen' to every sentence, as acknowledging the justice of the sentences. See Bingham's *Antiquities.*

**COMMISSA'RIAT** is a name for the organised system whereby armies are provided with food and daily necessaries, other than those connected with actual warfare. Among the ancients, the Romans attended best to the C.; the *quæstors* were the commissaries. In feudal times, the soldiers were mainly dependent for food on their lords; but they lived very much by plunder. During the wars of the Crusades, the C. was so utterly neglected, that thousands died of starvation.

In England, the first germ of the modern C. appeared in the office of *proviant-master*, in the time of Queen Elizabeth. Under Charles I., commissaries were stationed in the different counties. Under Marlborough's command, the troops were supplied by contract; he received a percentage, and peculation was very common. After many changes during the 18th c., a commissary-general was appointed in 1793, to superintend all contracts for food and forage. The dire experience of the Crimean war, shewed how greatly reform was required in this important department. In 1858 and 1859, accordingly, it was newly organised. The C. is now, as a War-office department, under a commissary-general-in-chief. The other grades are—commissary-general, deputy commissary-general, assistant commissary-general, deputy-assistant commissary-general, acting deputy-assistant commissary-general.

These successive grades are reached by promotion. The first appointments are all for commissioned subalterns of the army. In matters of honour or etiquette, a commissary-general ranks with a major-general in the army; and the other officers with various grades down to that of lieutenant. The full pay of the commissioned officers varies from £3 a day to the commissary-general-in-chief, down to 7*s.* 6*d.* a day to the lowest grade, that of acting deputy-assistant commissary-general. The subordinates are clothed, fed, and paid rather better than soldiers.

The C. has now the management of the provisions and some other necessaries for the whole army, whether in peace or war. The United Kingdom is divided into certain military districts, for each of which separate contracts are entered into, in relation to bread, meat, and forage; and the contracts are made by open competition. The C.-*chest* is the name given to all the outstanding accounts between the C. and the Paymaster-general of the Forces; in peace, there are 70 or 80 such accounts always open at the colonies and military stations abroad.

**CO'MMISSARY**, in general, is any one to whom the power and authority of another is committed. In this sense it is nearly equivalent to commissioner. In ecclesiastical law, a C. is an officer appointed by a bishop to exercise jurisdiction in parts of the diocese which are so distant from the episcopal city that the people cannot be conveniently summoned to attend the principal court.

When the papal authority, and all jurisdiction which flowed from it, was abolished in Scotland, by the Acts 1560 and 1567, a supreme C. court was established in Edinburgh, by a grant of Queen Mary, dated February 8, 1563. This court had jurisdiction in actions of divorce, declarators of marriage, nullity of marriage, and all actions which originally belonged to the bishop's ecclesiastical courts. Its powers were gradually conjoined with those of the Court of Session, and it was finally abolished in 1836 (6 and 7 Will. IV. c. 41), the small remains of its once important jurisdiction being transferred to the sheriff of Edinburgh. The inferior commissariats, which had usually been commensurate with the dioceses, had been abolished by a previous statute (4 Geo. IV., c. 97), each county being erected into a separate commissariat, of which the sheriff is commissary. 'The jurisdiction now left to the commissary-courts in Scotland,' says Mr Alexander, 'is limited to decreeing and confirming executors to deceased persons having personal property in Scotland, and relative incidental matters.' —*Practice of the Commissary Courts in Scotland*, 1858. In the first chapter of this work, the reader will find a very interesting sketch of the history, constitution, and jurisdiction of these courts.

**COMMI'SSION**, a writing, generally in the form of a warrant or letter-patent (q. v.), authorising one or more persons to perform duties or exercise powers belonging to another, or to others. Instruments of delegation, bearing this title, are issued by the crown to officers in the army and navy, judges, justices of the peace, and others.

Another class of commissions are those granted sometimes by the crown, and sometimes by parliament, to a body of persons, either to inquire into the condition of certain institutions or branches of the public service, or to exercise certain powers, or execute certain measures for their improvement. Persons holding such commissions, deriving no other title from their appointment, are called commissioners; e. g., the English Ecclesiastical Commissioners, the Commissioners for the Relief of the Poor, the Commissioners for the Affairs of India, the Emigration Commissioners, &c.

**COMMISSION DEL CRE'DERÉ.** See DEL CREDERE COMMISSION.

**COMMISSION MERCHANT, or AGENT**, called also a broker, or factor, is a person employed to sell goods consigned or delivered to him by another who is called his principal, for a certain percentage, commonly called his commission or factorage. As the goods thus received are said to be consigned, the C. M. or agent is often called a consignee.

**COMMISSION OF ASSEMBLY.** See GENERAL ASSEMBLY.

**COMMISSIONAIRES** are a class of attendants at continental hotels, who perform certain miscellaneous services. Employed to attend at the arrival of railway-trains and steam-boats to secure customers, they wait to take charge of luggage, see it passed through the hands of the custom-house officers, and send it on to the hotel; for all which service they charge a fee. They likewise procure visés to passports, and act as valets-de-place. In this last capacity, they may be hired for the day to conduct strangers to public places of interest, galleries of art, or other sights. In Paris, they are generally respectable and intelligent, and speak English with tolerable fluency. In the French outports, such as Boulogne, they can be referred to less favourably.—Lately, a body of C. has been established in London, and also in Edinburgh, consisting of maimed soldiers who have retired with a pension, and are of unexceptionable character. On a moderate tariff of charges, they act as messengers, light-porters, valets-de-place, and make themselves otherwise useful.

**COMMI'SSIONER**, in Scotch Bankruptcy. This office has little or no resemblance to that of the official in England bearing a similar title. In Scotland, three commissioners are appointed by the creditors to advise, and in certain cases to superintend the trustee, who is the party charged with the realisation and distribution of the estate. The commissioners audit the trustee's accounts, they fix his remuneration, and they have to ascertain that the moneys collected by him have been duly lodged in bank. They themselves are not entitled to remuneration; and they cannot purchase any portion of the estate. Their qualification is to be creditors, or mandatories of creditors; but any disqualification for the office of trustee also unfits for this office.

**COMMISSIONS**, ARMY, are warrants for serving the crown in certain military offices. Those holding such authority are called *commissioned officers*. Non-commissioned officers form a step intermediate between commissioned officers and private soldiers. A candidate for a commission must pass an examination in various branches of knowledge, civil and military. He is then placed on a list where he remains till a vacancy occurs in some regiment; when, as a general rule, he receives, with or without purchase, his commission, and enters as cornet or ensign. The purchase system, it is to be observed, is limited to the infantry and cavalry; and even in these corps it does not extend beyond the rank of lieutenant-colonel. The prices of purchasable commissions are regulated by the following official scale:

| Rank. | Full Price of Commissions. | Dif. in value between the several Com. in succession. |
|---|---|---|
| LIFE GUARDS. | | |
| Lieutenant-colonel, . . | £7250 | |
| Major, . . . . | 5350 | £1900 |
| Captain, . . . . | 3500 | 1850 |
| Lieutenant, . . . | 1785 | 1715 |
| Cornet, . . . | 1260 | 525 |
| ROYAL REGIMENT OF HORSE GUARDS. | | |
| Lieutenant-colonel, . . | £7250 | |
| Major, . . . . | 5350 | £1900 |
| Captain, . . . . | 3500 | 1850 |
| Lieutenant, . . . . | 1600 | 1900 |
| Cornet, . . . . | 1200 | 400 |
| DRAGOON GUARDS AND DRAGOONS. | | |
| Lieutenant-colonel, . . | £6175 | |
| Major, . . . . | 4575 | £1600 |
| Captain, . . . | 3225 | 1350 |
| Lieutenant, . . . . | 1190 | 2035 |
| Cornet, . . . . | 840 | 350 |
| FOOT GUARDS. | | |
| Lieutenant-colonel, . . | £9000 | |
| Major, with rank of Colonel, . | 8300 | £700 |
| Captain, 〃 Lieut.-col., | 4800 | 3500 |
| Lieutenant, 〃 Captain, . | 2050 | 2750 |
| Ensign, 〃 Lieutenant, | 1200 | 850 |
| LINE REGIMENTS. | | |
| Lieutenant-colonel, . . | £4500 | |
| Major, . . . . . | 3200 | £1300 |
| Captain, . . . . | 1800 | 1400 |
| Lieutenant, . . . | 700 | 1100 |
| Ensign, . . . . | 450 | 250 |

The Fusilier and Rifle regiments exhibit a modified and a limited adoption of the system—viz., a 2d lieutenant pays £500, and £200 more when he rises to the rank of 1st lieutenant.

The value of commissions in the British army in 1856 amounted to £5,000,000; and it is estimated that at present (1861) it would require £8,000,000 to buy them all up.

The conditions of promotion, and the operation of the purchase system, will be considered under OFFICERS, MILITARY. In the navy also, the chief officers hold their authority by commission. See OFFICERS, NAVAL.

**COMMI'TMENT.** See IMPRISONMENT.

**COMMI'TTEE** (Fr. *comité*), a portion, generally consisting of not less than three members, selected from a more numerous body, to whom some special act to be performed, or investigation to be made, is *committed*. But though a C. usually consists of several members of the body by which it is appointed, it may consist of one member, or, what is more frequent, of the whole members acting in a different capacity from that which usually belongs to them. This latter form of C. is known in parliament as a C. of the whole House. In order to mark the distinction between the House itself and the same body when thus resolved into C., the Speaker in the Commons, and the Chancellor in the Lords, as soon as the C. is formed, leave the chair, which is occupied by the Chairman of C., a paid official, who is appointed at the commencement of every parliament. In the Commons, moreover, the mace, which usually lies on the table, is put under it when the House goes into committee. Of committees of the whole House, the most familiar examples are Committees of Supply (q. v.) and of Ways and Means (q. v.). The vote of a C. is of no force till it has been reported to and received by the House. In the case of every public bill, moreover, a C. of the whole House is constituted after the second, and before the third reading, in order that the details of the measure may be more carefully adjusted. In private bills, analogous functions are performed by select committees. Occasional matters requiring special investigation are also remitted to select committees. These, for the most part, conduct their investigations in public; but there are instances also in which the public safety seems to require secrecy, in which they deliberate with closed doors, and they are then called *Secret Committees*.

**CO'MMODORE**, in the Navy, is a rank intermediate between an admiral and a captain. It is not permanent, but is bestowed for a time on a captain. Usually, a C. commands more ships than one, detached from a fleet on some special service; he hoists at that time a pendant. If a C. of the first class, his pendant is broad and red, pointed at the outer end; if of the second class, blue. A C. is privileged to have a commander under him in his ship, in the same way as an admiral is privileged to have a captain. The C., in matters of etiquette, ranks on a level with a brigadier-general in the army. The pay of a C. varies from £550 to £1640 per annum, when in command, in addition to his pay as captain of the ship to which he belongs.

**CO'MMODUS**, LUCIUS AURELIUS, a Roman emperor, born 161 A. D., was the son of Marcus Aurelius Antoninus. Great pains was taken with his education. But the solicitude of his father was all to no purpose. C. only waited for an opportunity to exhibit as startling and detestable a mixture of sensuality, cruelty, and meanness as had ever been witnessed in Rome. When he was summoned to the throne on his father's decease, 17th March 180, he manifested a shameful eagerness to plunge into the dissipations of Rome. At that period he was successfully fighting the Marcomanni and other tribes on the Upper Danube, and, not to be balked of his anticipated pleasures, he hastily concluded a treaty with the barbarians, and reached the capital in the beginning of the autumn. The cruelty to which he was always prone, was especially called into action after a conspiracy by his sister Lucilla against his life had been discovered in the year 183. Nearly all who, by virtue, ability, and learning, had risen to honour during his father's lifetime, were sacrificed to appease his savage jealousy of the good and the great. Gross prodigality in the expenditure of the resources of the state on the amusements of the amphitheatre also marked his reign. He was proud of his own physical strength, and exhibited it in gladiatorial combats. For each of these exhibitions, he charged the state an enormous sum. He used also to sing, dance, play, act the buffoon, the pedlar, or the horse-dealer, and engage in all the filthy and horrible orgies of Egyptian sacrifice. A glutton, a debauchee, who wallowed in the most sensual abominations, he yet demanded to be worshipped as a god, and assumed the title of Hercules Romanus. Many plots were devised against the life of this mingled monster and madman. Happily, Providence at last permitted one to be successful. His mistress, Marcia, in concert with the prefect Laetus, and the imperial chamberlain Eclectus, after an attempt to poison him had failed, caused him to be strangled by Narcissus, a famous athlete, December 31, 192.

**CO'MMON**, in Law. This is one of the numerous instances in which a different meaning is attached to the same term in the legal systems of England and Scotland. In England, a C., as defined by Blackstone, is 'a profit which a man hath *in the land of another*, as to feed his beasts, to catch fish, to dig turf, to cut wood, or the like.' In Scotland, again, where the law has adopted the divisions, and followed the nomenclature of the civil law, and of the legal systems of continental Europe, all these profits, or rights to derive profit, are known as *Servitudes* (q. v.), whereas a C., or Commonty, as it is more frequently called, is a common right of property existing in several individuals, frequently the inhabitants of a whole village, in a piece of ground. In each individual, the right of course is limited, so as in reality to amount to little more than a servitude; but there is no over-lord, the land is not the land of another, but the land of the community as a body.

The division of C. lands, or those over which C. is claimed, among the parties possessed of such rights, or the permission to the owner to enclose the lands on making compensation to the owners of C. rights, has been the subject of regulation by a very great number of statutes. Many of these are private acts, but the 6 and 7 Will. IV. c. 115 laid down general rules for effecting the purpose in future, without the necessity of obtaining an act of parliament, where the consent of two-thirds of the parties interested could be obtained, and the C. to be enclosed lay more than ten miles from London, and a specified distance from any other large town. By a subsequent statute (8 and 9 Vict. c. 118, amended by several later acts), a Board of Commissioners (see ENCLOSURE COMMISSIONERS) is appointed to inquire into the propriety of any proposed enclosure or partition, and to report to parliament, which then may pass a public act authorising the proceedings. This is the course generally adopted.

In Scotland, *commonties* or commons were made divisible by an action in the Court of Session, at the instance of any having interest, by the stat. 1695, c. 38.

On the subject of enclosing commons, Mr J. S. Mill (*Dissertations and Discussions*, vol. ii. p. 213) expresses the following decided opinion: 'We must needs think, also, that there is something out of joint, when so much is said of the value of refining and humanising tastes to the labouring-people—when it is proposed to plant parks and lay out gardens for them, that they may enjoy more freely nature's gift alike to rich and poor, of sun, sky, and vegetation; and along with this a counter-progress is constantly going on of stopping up paths and enclosing commons. Is not this another case of giving with one hand and taking back more largely with the other? We look with the utmost jealousy upon any further enclosure of commons. In the greater part of this island, exclusive of the mountain and moor districts, there certainly is not more land remaining in a state of natural wildness than is desirable. Those who would make England resemble many parts of the continent, where every foot of soil is hemmed in by fences and covered over with the traces of human labour, should remember that where this is done, it is done for the use and benefit, not of the rich, but of the poor; and that in the countries where there remain no commons, the rich have no parks. The common is the peasant's park. Every argument for ploughing it up to raise more produce, applies *à fortiori* to the park, which is generally far more fertile. The effect of either, when done in the manner proposed, is only to make the poor more numerous, not better off. But what ought to be said when, as so often happens, the common is taken from the poor, that the whole or great part of it may be added to the enclosed pleasure-domain of the rich? Is the miserable compensation, and though miserable not always granted, of a small scrap of the land to each of the cottagers who had a goose on the common, any equivalent to the poor generally, to the lovers of nature, or to future generations, for this legalised spoliation?'

**COMMON**, Tenancy in. This is an Estate (q. v.) or a right in property accruing to two or more persons; and the nature of it is, that each has a distinct right to his own share, although no division has yet been made. But the common owners may agree to a partition, or one of them may, in equity, compel a partition. If the estate is one which passes by inheritance, the heir of each owner takes his share, and there is no benefit of survivorship. A tenancy in C. may be created either by a conveyance in express words, or by the parties obtaining their titles at different times, or at the same time from different parties. But if the title accrues by descent from the same ancestor, even though at different times, it is a tenancy in Coparcenary (q. v.).

**COMMON BENCH.** See Bench and Common Law, Courts of.

**COMMON CHORD.** See Chord.

**COMMON COUNTS.** Short formal statements of the cause of action made in a Declaration (q. v.).

**COMMON DEBTOR.** See Debtor.

**COMMON FORMS.** Formal phrases, often of great length and prolixity, used in deeds in England. It has been attempted to substitute, for some of these, short expressions conveying all the meaning of the C. F.; but the statutes by which the attempt was made (8 and 9 Vict. c. 119 and c. 124), being permissive merely, have never been adopted in practice. A main reason for the preservation of C. F. lies in the general rule that conveyancers are paid not according to value, or the difficulty of their task, but according to the length of a deed. A statute of last session (23 and 24 Vict. c. 145) made a further effort to abolish the C. F. used in appointing trustees, &c., by giving to them the powers which were formerly contained in the common forms.

**COMMON GOOD.** See Corporation.

**COMMON HOUSE**, or **COMMON ROOM**, was an apartment in a monastery in which a fire was constantly kept burning for the use of the monks, who frequently were allowed no fire anywhere else. The C. H. was presided over by a monk, who was called the master. It was the prototype of the common rooms in the colleges and halls of the English universities.

**COMMON LAW**, in England. These words, in their proper sense, signify the ancient consuetudinary law of England. The C. L. is therefore distinguished from the statute law and from equity. But there is a difference in the relation in which it stands to these two coexistent codes. It is wholly overruled by the statute law, wherever that law stands in opposition to it. But it maintains its force in spite of any discordant rules of equity, which can therefore only take effect through the intervention of a court by which the C. L. is in any particular case placed in temporary abeyance. For the cases in which this result is possible, see Equity.

The C. L. is thus essentially an unwritten law. Its rules have been handed down by tradition, sometimes in a complete and definite shape, such as the law of primogeniture, the jurisdiction of the courts, &c.; sometimes as a mere spirit or tendency, according to which, in novel cases, as they may arise, the law is to be expounded. Thus, the law-merchant is chiefly part of the C. L., although only some of its rules are of real antiquity, and the greater portion of them were established no later than the last century. Therefore, in such cases, the C. L., though accounted traditional, is, in fact, made by the judges who declare it, who enounce new rules suited to new combinations of circumstances, and merely bearing an analogy to what the ancient C. L. has established in cases which fell within its purview. It is therefore not wonderful that there should frequently be dispute as to what the C. L. is, and that different courts should occasionally give different decisions upon such questions.

As the C. L. has never been formally enacted, nor has yet been reduced to a regular code, it is to be sought for in the treatises of institutional writers, and in the decisions of the courts of law. These last are of the highest authority, and where they are consistent, they are taken as irrevocably establishing the law. But being declaratory merely, and not imperative, a single judgment of a court is not held conclusive upon courts of equal jurisdiction, though it is commonly accepted as binding by inferior courts. A court may even depart from its own decision, if it shall come to be of opinion that the law has before been incorrectly stated. But this principle perhaps undergoes an exception in the House of Lords, which being the highest court of all, it is laid down by some of the law peers that its judgments have the force of statute, and that the rules it has once sanctioned can be altered only by statute. The point, however, cannot yet be regarded as settled.

The C. L. is applicable to the whole realm, but it is part of its principles, that in particular circumstances it may recognise rules which are not of universal application; thus, in certain courts, it adopts as its own the provisions of codes which it entirely rejects in other courts. The civil and canon law are in some of their rules recognised as part of the C. L. in the Maritime and Ecclesiastical Courts (including under the latter denomination the new courts of Probate and Divorce), but they are of no authority whatever in the courts by which the main branches of the C. L. are administered. So also, in particular localities, customs exist which the C. L. sanctions, although they may be at variance with its general provisions. Such are the rules regarding succession which prevail in Kent under the name of Gavelkind (q. v.), and in certain towns under the name of Borough English (q. v.). But customs of much more circumscribed operation are, when proved, equally accepted by the C. L. as part of itself within the limits in which it prevails; for the C. L. being itself the embodiment of custom, cannot reject custom merely because it is local, if it be not otherwise contrary to its spirit. In order to entitle a custom to the force of law, it must be of such endurance 'whereof the memory of man runneth not to the contrary.' The period thus indicated is more precisely defined as extending to the commencement of the reign of Richard I. By this is meant, however, not that the custom must be proved to have been in perpetual vigour since that remote epoch, but that proof of its non-existence within that period will invalidate it. If no such proof is adduced, the custom will be established by the evidence of experienced living witnesses, or by such documentary evidence as the nature of the case may render available.

When at the present day C. L. is spoken of in distinction to equity, it includes not merely the traditional law, but such statutory law as bears upon subjects falling within the domain of common law. Of late years, it has in this way been greatly extended, many statutes having conferred on the courts of C. L. a variety of powers which till then were available only to the suitor in equity.

COMMON LAW, Courts of. These are generally divided into Superior and Inferior. The superior sit at Westminster, and hence are often called the Courts at Westminster. They consist primarily in the Court of Queen's Bench, the Court of Common Pleas or of Common Bench, and the Court of Exchequer. These are all offshoots of the great court, the *aula regia* of the early Norman kings, which, under the presidency of the chief-justiciar, and composed of the great officers of state and of the household, of the principal nobility, and of the justices learned in the law, attended the king's person wherever he went, and formed the sole superior court of the kingdom. But the inconvenience attending so transitory a judicature led to the demand, conceded in Magna Charta, c. 12, that *communia placita*, common pleas, should be held in a fixed place, and hence arose the establishment of the court of that name. Afterwards, under Edward I., the office of chief-justiciar was abolished, and the judicial functions of the aula regia partitioned among the Court of Chancery and the three courts of C. L. above named. Originally, the jurisdiction of each of these was exclusive: the Court of Queen's Bench being chiefly devoted to questions bearing upon the public peace; the Court of Common Pleas to questions relating to real estate; and the Court of Exchequer to matters relating to the revenue and the royal property. But by a gradual system of encroachments, founded upon legal fictions, the barriers between their jurisdictions were broken down, and now by statute each court may entertain actions founded on C. L. rights of every description, the selection resting on the option of the plaintiff. In certain matters, not in the nature of actions, there still, however, remains a division of authority. These will be briefly indicated under the head of each court.

1. *Court of Queen's Bench.*—This court is composed of a chief-justice, who is entitled to the style of Chief-justice of England, and four puisne judges or justices. Its peculiar powers consist chiefly in the exercise of supervision over the proceedings of inferior courts and magistrates, to the effect of restraining them from exceeding their jurisdiction, or of compelling them to perform their duty, and in the control of corporations in the event of illegal procedure.

2. *Common Pleas.*—This court retained exclusive jurisdiction over real actions so long as they existed, but as they have now been abolished in favour of simpler forms which are equally available in the other courts, it now has few peculiar powers. A remnant of its original authority is reserved to it in the restriction of the actions which come in lieu of the old writs of dower to this court (23 and 24 Vict. c. 126, s. 26), and in the rule that certain deeds affecting land must be registered in the Court of Common Pleas. This court is also by statute the court of appeal from the decisions of the revising barristers (q. v.). It is presided over by a chief-justice, styled 'of the Common Pleas,' and consists besides of four puisne justices.

3. *Exchequer.*—This court still retains exclusive authority in all matters relating to the revenue. It was at one time a court of equity, as well as of common law, but the equity branch (which was always distinct) was abolished by 5 Vict. c. 5. It is composed of a chief-baron and four puisne barons.

The chiefs of these courts are appointed by the ministry; the puisne judges, by the Lord Chancellor. The salary of the Chief-justice of the Queen's Bench is £8000; that of the Chief-justice of the Common Pleas, and the Chief-baron of the Exchequer, £7000; and that of the puisne judges, £5000 per annum.

Subordinate to these is a court called the Bail Court (q. v.).

From the decision of either of the three superior courts in civil actions, an appeal, or, as it is termed at common law, proceedings by writ of error, lies to a court styled the *Exchequer Chamber.* This was established by 11 Geo. IV. and 1 Will. IV. c. 70, and consists of the judges of the two courts other than that whose judgment is under review; and from the decision of this court 'error' lies to the House of Lords (q. v.).

The sittings of the three superior courts are held only during Term (q. v.), when they are said to sit *in banc*, and when they decide on all questions of law that may arise in the actions brought before them. But questions of fact, unless both parties consent to leave them to the decision of the court (17 and 18 Vict. c. 125, s. 1), are decided by a jury, and the courts in which they are tried are held out of term-time, before one or two judges only, not necessarily of the court to which the action belongs. These trials take place either on Circuit (q. v.), or at the London and Westminster sittings, which are held after every term, and in either case are called trials at *nisi prius.* The verdict is returned to the court to which the action belongs, by which it is disposed of according to law.

The authority of the superior courts of C. L. extends over the whole of England, and over common law rights of every description. But since the remodelling of the county courts, it has been enacted by several statutes, with a view to discourage resort to such high judicatures in trifling cases, that in some species of actions in which less than £20, and in other species in which less than £5 shall be recovered, in the superior courts, no costs shall be allowed the plaintiff, unless the judge who tries the case shall certify that there was sufficient reason for its being brought in the superior courts.

The inferior courts are restricted both in respect of place and matter. They are extremely numerous, few that ever existed having been formally abolished; but they are now, with few exceptions—the principal of which is the modern county court (q. v.)—matter of interest to the antiquary rather than either to the practical lawyer or the public. They may therefore be passed over with very brief explanation.

The *Court Baron* was a court composed of the tenants of each lord of a manor. It might decide on all real actions (now abolished) arising within the manor, and on personal actions below the value of 40*s.*, but subject to review by the court at Westminster. In a manor comprising Copyholds

(q. v.), it is still of importance. The *Hundred Court* was a similar court, composed of the freeholders within the Hundred (q. v.), and had like powers with the Court Baron. The Court of *Pie Poudre*, or dusty foot, was held by the steward of a manor to which a market belongs, for the decision of all questions of bargaining at the markets. The *Forest Courts*, of several classes, were for the preservation of the beasts of the chase, and the protection of the subject from oppression by the officers of the forest. The *Courts of Request* in boroughs were for the recovery of small debts, but are now abolished.

The *Borough Courts* still exist, and are held under the presidency of the Recorder (q. v.). From them a writ of error lies to the superior courts. The *Lord Mayor's Court*, and the *Sheriff's Court*, in the city of London, have a considerable amount of business. The *Court of Hustings* in London is practically obsolete. The *Court of the Cinque Ports* is held before the mayor and jurats of each port, from which error lies to the Lord Warden of the Cinque Ports Court at Shepway, and thence to the Queen's Bench. The *Stannary Courts* in Cornwall and Devonshire are also still in use, and exclude, as to the tin-workers, the jurisdiction of all other courts, except in pleas of land, life, or member. They are held before the vice-warden of the Stannaries, and appeal lies only to the warden, assisted by two of the judges; and from him to the judicial committee of the Privy Council (18 and 19 Vict. c. 32). There are in these counties also *Barmote Courts*, for regulating questions relating to the mines (14 and 15 Vict. c. 94). The Courts of the Chancellors of the universities of Oxford and Cambridge have also exclusive jurisdiction (except as regards freeholds), where the defendant is resident in the town, and a scholar or privileged member of the university is a party.

The Court of Common Pleas in Lancaster, and the Court of Pleas in Durham, have jurisdiction in all personal actions, and error lies from them to the Court of Queen's Bench.

**COMMON LAW BAR**, that portion of the English bar which devotes itself to practise in the common law courts, distinguished from the equity bar, which practises only in the Courts of Chancery.

**COMMON LODGING-HOUSES.** See LODGING-HOUSES.

**COMMON PLEAS.** See COMMON LAW, COURTS OF.

**COMMON PRAYER-BOOK.** This book contains the forms of public worship and administration of the sacraments and other rites and ceremonies according to the use of the United Church of England and Ireland. It is, for the most part, a translation of such portions of the services of the ancient Catholic Church as were considered by the Reformers free from all objection. Before the Reformation, the liturgy was in Latin, and the form generally adopted in the south of England was that after the use of Salisbury. The first steps towards its reformation were taken by Henry VIII., the main objects in view being the abolition of what was superstitious, and the translation of the services into the vulgar tongue. In the year 1540, a committee of bishops and divines was appointed for the purpose, and what was done by them was revised by convocation in 1543. In the year 1545, the *King's Primer* came forth, containing, amongst other things, the Lord's Prayer, Creed, Ten Commandments, 'Venite,' 'Te Deum,' Litany, and other hymns and collects in English, several of which were in the same version as at present used. It was, however, in the reign of Edward VI. that the most important steps were taken for framing a new service-book. In opposition to the practice introduced by the Roman Catholic Church, an act of parliament was passed, ordering the communion to be administered to the laity in both kinds, and a formulary was drawn up for this purpose, and used at the end of the Latin mass. In the following year, a complete service-book was drawn up, including offices not only for Sundays and holidays, but for the administering of baptism and confirmation, for matrimony, the burial of the dead, and other occasions, together with the above-mentioned office for the communion considerably altered. This book was compiled by Cranmer and Ridley, assisted by eleven other divines; it was revised by convocation, and confirmed by king and parliament, and published in 1549, and is known as the FIRST PRAYER-BOOK of Edward VI. It differed from the one now in use by beginning the daily service with the Lord's Prayer, by retaining prayers for the dead, and directing the use of the sign of the cross in confirmation and visitation services, and the anointing of the sick. It was drawn up with great prudence, retaining as much, and altering as little as possible of what had been familiar to the people. In 1550, the ordination service was added, taken principally from that used by the Roman Catholic Church, but omitting certain ceremonies, and adding most of the questions proposed to the candidates. This service differed but little from that now in use, as authorised in 1662.

In 1551, objections, as might be expected, were made from various quarters to this *first* prayer-book, and Cranmer proposed to revise it, and called to his assistance two distinguished foreign reformers—Martin Bucer, and Peter Martyr. In this revision, some of the principal alterations were the addition of the opening sentences, the exhortation, confession, and absolution at the beginning of the service, the disuse of oil in baptism, of unction of the sick, and of prayers for the dead. The book thus altered was confirmed by act of parliament in 1552, and is called the SECOND PRAYER-BOOK of Edward VI.

In the reign of Queen Mary, the acts of 1549 and 1552 were repealed, and therefore, at the accession of Elizabeth, it was necessary to reverse this repeal; and this afforded a fresh opportunity of revising the whole. The question then arose (1560) as to which of King Edward's two books should be adopted. The queen herself would probably have preferred the first, as containing many of the old ceremonies to which she was attached, but the second was chosen, and a few unimportant changes introduced. This may be called the THIRD COMMON PRAYER-BOOK. No alteration was made by it as to the use of church ornaments and vestments, which were directed by the act of uniformity, 1559, to be retained as they were left by the authority of parliament in the second year of Edward VI.

On the accession of James I., after the Hampton Court Conference, the book was again revised; and a few judicious changes made, e. g., some forms of thanksgiving were added for special occasions, and the explanation of the sacraments by Dr Overall after the catechism; midwives and laymen were also prohibited from baptising. In this state, the C. P. was left until the Restoration, when, at the request of the Presbyterians, the king consented to a fresh revision, 1661. Twelve bishops were appointed to confer with an equal number of Presbyterian divines, each side having nine coadjutors. They were to consider the principal objections raised against the liturgy as it then stood. This was called the Savoy Conference. The Presbyterians brought forward all the objections that had been made by the Puritans for the last century, adding new ones of their own. Baxter went so far as to say that it was incapable of amendment, and was bold enough to offer an entirely new liturgy of his own composition to be received in the place of the authorised one. It is hardly necessary to add, that the conference broke up without anything being done, except that the bishops proposed a few alterations, which were adopted by convocation in 1662, and confirmed by act of parliament. Among these changes, the new authorised version of the Scriptures was adopted, except in the Psalms (which follow the version of Coverdale's Bible, and had become familiar to the people), and in the commandments and the sentences at the communion service; the general thanksgiving was added, and the form of prayer to be used at sea. It is proper to observe that the four forms of prayer known as the *State* Services—viz., for Gunpowder Treason, on November 5; for King Charles's Martyrdom, January 30; for the Restoration, May 29; and the King's Accession; were never properly a part of the C. P., but have been annexed to it by order of the king in council at the beginning of every reign. Upon an address of both Houses of Parliament, an order in council was given by Queen Victoria for discontinuing the first three. There have been four acts of uniformity—viz., in 1548 and 1552, both of which were repealed by that of Elizabeth in 1559; and the last in the 14th year of Charles II., 1662, which left that of Elizabeth unrepealed. In the Great Rebellion, 1643, the Long Parliament prohibited the use of the common prayer-book. At the Revolution in 1688, no change was introduced into the prayer-book; for although a commission was appointed for the purpose, the second downfall of Episcopacy in Scotland in 1689 caused such alarm in the English Church that it was thought unadvisable to press further changes.

Concerning the use of the English C. P. in Ireland, it is sufficient to say that, in 1551, the first prayer-book of Edward was introduced by the king's authority after some opposition. In 1560, an Irish act of uniformity, copied from the English one, was passed, enjoining the use of the revised book; and again in 1662, the English revised liturgy was adopted by the Irish convocation, and four years later, the Irish act of uniformity was passed. In Scotland, which had as yet no settled liturgy, Laud attempted to introduce the English prayer-book, but with alterations in the communion service which were likely to be very offensive to a people so hostile to the Church of Rome. This attempt was followed by riots, and ultimately led to the abolition of the Scotch Episcopate and to the Solemn League and Covenant. The English C. P. is now used in most of the Episcopal churches in Scotland, but in some the old liturgy is used in the communion service. In the United States, also, the English C. P. is used with some slight changes.

**COMMON SENSE, The Philosophy of.** The full explanation of this phrase would imply an account of the leading problems of metaphysical philosophy. There are certain beliefs that have been current among men in all ages, which, when canvassed by one set of philosophers, have been declared to be groundless illusions. Of these, the most remarkable instance is the belief in an external, material world, independent of any mind to perceive it. The doctrine put forth by Bishop Berkeley, as opposed to the common opinion, was, that 'the whole universe subsists, and can only subsist, within such a sentient, invisible, and conscious thing as the mind is known to be. In this way, each human mind must have within it a separate universe of its own, but so exactly the same in all minds, that every object of sense, and every movement of every object that is to be found in the universe of one mind, is to be found also in the universe that is within the other mind; the general effect of all which conditions is much the same as that which would be produced if several people were all dreaming, exactly at the same time, exactly the same dream.' 'The result of Berkeley's inquiry,' says Dr Reid, 'was a serious conviction that there is no such thing as a material world—nothing in nature but spirits and ideas; and that the belief of material substances, and of abstract ideas, are the chief causes of all our errors in philosophy, and of all infidelity and heresy in religion. His arguments are founded upon the principles which were formerly laid down by Des Cartes, Malebranche, and Locke, and which have been very generally received. And the opinion of the ablest judges seems to be, that they neither have been nor can be confuted; and that he hath proved, by unanswerable arguments, what no man in his senses can believe. Hume proceeds upon the same principles, but carries them to their full length; and as the bishop undid the whole material world, this author, upon the same grounds, undoes the world of spirits, and leaves nothing in nature but ideas and impressions, without any subject on which they may be impressed.'—*Inquiry into the Human Mind*, c. 1, s. 5.

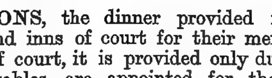
A dead-lock in philosophy was the result of those doctrines of Berkeley and Hume; and the solution offered by Reid consisted in setting up C. S. as an arbiter from which there could be no appeal; that is to say, the universally admitted impressions of mankind were to be taken as corresponding to the fact of things without any further scrutiny. Reid's philosophy of C. S. has thus found a place in the thinking-world; and it is only the same view otherwise expressed, when it is declared by other philosophers that the deliverance of consciousness must be presumed true. Sir W. Hamilton, in the most elaborate vindication of the C. S. philosophy that has ever been produced (edition of Reid's works), dwells largely upon this last view of the subject. The following extract is a specimen of his mode of reasoning: 'When, for example, consciousness assures us that, in perception, we are immediately cognizant of an external and extended *non-ego* (not-self); or that, in remembrance, through the imagination, of which we are immediately cognizant, we obtain a mediate knowledge of a real past: how shall we repel the doubt—in the former case, that what is given as the extended reality itself is not merely a representation of matter by mind; in the latter, that what is given as a mediate knowledge of the past, is not a mere present phantasm, containing an illusive reference to a real past? We can do this only in one way. The legitimacy of such gratuitous doubt necessarily supposes that the deliverance of consciousness *is not to be presumed true.* If, therefore, it can be shewn, on the one hand, that the deliverances of consciousness must philosophically be accepted *until* their certain or probable falsehood has been positively evinced; and if, on the other hand, it cannot be shewn that any attempt to discredit the veracity of consciousness has ever yet succeeded; it follows that, as philosophy now stands, the testimony of consciousness must be viewed as high above suspicion, and its declarations entitled to demand prompt and unconditional assent.'

'In the first place, it cannot but be acknowledged that the veracity of consciousness must at least, in the first instance, be conceded. Nature is not gratuitously to be assumed to work, not only in vain, but in counteraction of herself.' 'But in the second place, though the veracity of the primary convictions of consciousness must, in the outset, be admitted, it still remains competent to lead a proof that they are undeserving of credit. But how is this to be done? As the ultimate grounds of knowledge, these convictions cannot be redargued from any higher knowledge; and as original beliefs, they are paramount in certainty to every derivative assurance.' 'It will argue nothing against the trustworthiness of consciousness, that all or any of its deliverances are inexplicable—are incomprehensible. To make the comprehensibility of a datum of consciousness the criterion of its truth, would be indeed the climax of absurdity.' (P. 745.)

The conclusiveness of this reasoning is disputed by many, who object, that consciousness (q. v.) is a very wide word, comprising indeed everything that we call mind; and it is proverbially unsafe to argue in generalities. Suppose, it is argued, we were to substitute 'memory' in the above reasonings, and to maintain that the veracity of each one's memory was beyond all question or dispute, it would be apparent at once how the case really stands. In one meaning, and in one set of circumstances, memory is sure, or even, if we please, infallible—that is, when we record an observation the moment after we have made it. For a short interval of time, a simple fact, or a brief statement, may be recollected with entire certainty. On the other hand, the lapse of days, months, or years, and the complicacy of the fact, not to mention the bias of the feelings, are known to cause great uncertainty in our recollection, and in such circumstances we do not implicitly rely on it. In a word, *experience* is the criterion of how far the memory is to be trusted. Possibly, therefore, the same thing may turn out to be true of the larger fact named consciousness.

The truths of C. S., or consciousness, are such as these: the laws of Identity, Contradiction, and Excluded Middle (see Identity); the axioms of Mathematics; the law of Causality (see Cause); the doctrine of an innate moral sense (see Ethics); the doctrine of man's Moral Liberty (see Free Will); the existence of an external world independent of every percipient mind. Such truths are designated by a variety of other names, with a view to contrast them with what we learn in the course of our education and contact with the world; they are termed Intuitions, Intuitive Cognitions, Instincts, Feelings, Beliefs, Principles, Ultimate or Primordial Elements, Truths *à priori*, Transcendental Cognitions, Truths of the Reason, &c.—*Hamilton's Dissertations*, note A. The philosophy of C. S., as promulgated by Reid, bore reference especially to the denial by Berkeley of the received view of the material world—a subject which falls to be considered under Perception.

**COMMON TIME**, in Music, is that species of measure which contains two minims or two crotchets in a bar. It is marked thus:



**COMMONS**, the dinner provided in English colleges and inns of court for their members. In the inns of court, it is provided only during term. Separate tables are appointed for the benchers (q. v.), for the barristers, and for the students and other members of the inn.

**COMMONS**, House of. See Parliament.

**COMMU'NION** signifies, in ecclesiastical language, that relation, involving mutual claims and duties, in which those stand who are united by uniformity of belief in one religious body or church. To exclude from this relation and its involved rights, is to *excommunicate*. The most visible symbol of this relation being the partaking together of the Lord's Supper, that rite is often called the Communion. See Lord's Supper.

**COMMUNION SERVICE.** See Common Prayer and Liturgy.

**CO'MMUNISM**, the name given to one class of the arrangements by which certain speculators have proposed to dispense with those laws of social and political economy which are supposed to keep society together, through the influence of the domestic affections and the spirit of competition, and to substitute in their stead a set of artificial rules for the government of mankind. The word Socialist has generally been applied to those who only propose to interfere with labour by abolishing competition and wages, leaving men to work under the influence of public spirit, and making an equal division of the produce. See Socialism. The term Communist, on the other hand, has been applied to those who go a step further, and propose to abolish the relation of husband and wife, along with the system of domestic government which is founded on the parental authority. While Louis Blanc may be considered the head of the Socialists, the representatives of the Communists are Robert Owen, St Simon, Fourier, Proudhon, and Enfantin. A knowledge of the projects of these men has fortunately of late years diminished in importance; and it is almost forgotten that, during the French revolution of 1848, their literature was greedily examined, under a terror that the leaders of C. were to rule the destinies of France and of other nations. It is said, indeed, that there is at this moment a powerful under-current of C. both in France and in Germany, ready to burst forth upon the world when an opportunity comes; but it may be hoped that the progress continually making in general intelligence, and a knowledge of economic laws, will avert such a calamity.

Although we usually consider C. an especially French fallacy, the first consistent practical teacher of it was our own countryman, Robert Owen. He published, in 1813, *A New View of Society, or Essays on the Principle of the Formation of the Human Character and the Application of the Principle to Practice*—in which he printed in large capital letters, as the key-note of his system, the following announcement: 'That any character—from the best to the worst, from the most ignorant to the most enlightened—may be given to any community, even to the world at large, by applying certain means, which are to a great extent at the command and under the control, or easily made so, of those who possess the government of nations.' No alarm was felt either at such a text or the comments made on it; nor did the world see what the author meant by the hint that there were special artificial means for improving the breed, as it were, of mankind, until he struck at the root of the domestic organisation, by such announcements as the following: 'The affections of parents for their own children are too strong for their judgments ever to do justice to themselves, their children, or the public in the education of their own offspring—even if private families possessed the machinery (which they never do) to well-manufacture character from birth.' He formed an organisation, too complex to be here detailed, by which families were to be subjected to a discipline which, that it might be perfectly uniform, should be carried out in parallelograms. Anticipating the results, he said: 'These new associations can scarcely be formed before it will be discovered that by the most simple and easy regulations all the natural wants of human nature may be abundantly supplied; and the principle of selfishness—in the sense in which that term is here used—will cease to exist, for want of an adequate motive to produce it.' He attested his reliance on the efficacy of his invention by sinking his own fortune in an attempt to build a parallelogram. It was commenced in the year 1825, at Orbiston, in Lanarkshire; but he did not meet with sufficient co-operation, and as his own funds only sufficed to build one corner of the parallelogram, it was impossible to give effect to arrangements which were fitted only for a completed edifice in that geometrical form. A considerable number of people—about 200, it is said—lived for some time in the building, little to their own advantage or that of the neighbours, who were naturally prejudiced against them, and probably exaggerated their irregularities; the building was soon deserted, and afterwards was totally obliterated. Owen had another opportunity of trying his parallelogram organisation in 1843, when 'Harmony Hall' was established in Hampshire by the zealous efforts of his followers, who formed a sort of sect in England. Still his theory had, as he deemed it, anything but fair-play, since so far did his disciples depart from that absolute undeviating conformity to the 'rational' system, as laid down by him, that they got tired of his incessant reiteration of it, and deposed him from his office of 'President of the Congress.'

Attempts to realise C. abroad were not more fortunate. Fourier's system was to be realised in 'phalanxes,' each containing 400 families, or about 1800 persons. A sum of about half a million of pounds is said to have been spent in the establishment of a 'phalanstery' at Rambouillet. It failed, and the founder of the system, like Owen, attributed the failure to the scheme being but imperfectly developed; but Fourier (q. v.) seemed always to have misgivings when his views were to be transferred from paper to practice, explaining that the preliminary process necessary to advance human nature to a state of civilisation sufficient for the enjoyment of the phalanx, was a long process which he could not live through. The St Simonians established a college or corporation at Menilmontant, with a 'supreme father'—who professed to act in that capacity not only to themselves, but to all the world—at their head. The leaders were brought to trial by the government of Louis Philippe, on a charge of undermining morality and religion. They were subjected to imprisonment, and not having public feeling with them, they were unable to bear up against the contumely thus thrown on them.

**COMMUTA'TION OF TITHES.** See Tithes.

**COMNE'NUS**, the name of a family, originally Italian, of which many members occupied the throne of the Byzantine empire from 1057 to 1204, and that of Trebizond from 1204 to 1461. See Byzantine Empire and Trebizond.—Anna Comnena (q. v.), who lived in the first half of the 12th c., is both of historic and literary celebrity.—David C., the last representative of the imperial race in Trebizond, was executed at Adrianople in 1462, with all his family, by command of Mohammed II. The attempt which has been made to trace the descent of the Bonaparte family from a branch of the Comneni settled in Corsica, is not supported by valid evidence.

**CO'MO**, a city of Lombardy, Northern Italy, beautifully situated at the south-west extremity of the Lake of Como. It lies in a valley, surrounded by hills, clad with luxuriant gardens, olive-plantations, and orange-groves, with here and there an old ruin cropping out. The city is surrounded by old walls flanked with towers, the gateways by which the walls are pierced being fine specimens of middle-age military architecture. Among the principal buildings of C. are the cathedral, built of marble, and containing some interesting pictures and monuments; the town-hall, also of marble, dating from the beginning of the 13th c.; and the churches of San Fedele and St Abondio. There are also many fine mansions of the nobility in C. and its suburbs. The port of C., on the lake, is formed of two piers, each terminating in a square pavilion, from which magnificent views are obtained. The inhabitants—including the suburbs—number about 20,000, and are very industrious. The chief articles of manufacture are silk, cotton, woollens, yarn, and soap, the last article having a high reputation. By means of its port, C. carries on extensive trade in the produce of the district with Switzerland. C., in the time of Pliny the Younger, had attained to a high degree of prosperity as *Comum Novum.* With the fall of the Roman empire, C. passed out of sight until 1107, when it began to war with Milan, and in the course of twenty years was utterly destroyed by its antagonist. It was rebuilt in 1155, by Frederick Barbarossa, and remained a republic for two centuries, when it fell into the hands of the Viscontis, its history since that time being bound up with that of Milan.

**COMO, Lake of** (Ital. *Lago di Como,* ancient *Larius Lacus*), a sheet of water in Lombardy, Northern Italy, lying at the foot of the Lepontine and Rhetian Alps, chiefly formed by the river Adda, which enters it at its north, and issues at its south-eastern extremity. The total length of the lake from Como to Riva is about 35 miles. About 15 miles from its northern extremity, the promontory of Bellagio divides it into two branches, the longer of which is between 18 and 20 miles; the other branch is about 12 miles long. The three arms of the lake sometimes receive different names—the upper part as far as Bellagio being called the Lake of Bellano; the longer branch, on which the town of Como is built, the Lake of Como; and the shorter, the Lake of Lecco. Lake Como, however, is the general designation. The greatest breadth of the lake is not more than 3 miles, but throughout the greatest part of its length, it is much less. The beauty of the surrounding scenery, and the salubrity of the climate, have made the Lake of C. the most celebrated and most resorted to in Italy, its shores being everywhere studded with fine villas. Queen Caroline once had a residence here. Numerous steam-boats ply upon the lake.

**COMODO'**, an island of the Malayan Archipelago, measuring 35 miles in length, and 16 miles in average breadth. Lat. of north-east extremity, 8° 22′ S., long. 119° 37′ E. C. occupies nearly the entire width of the strait, which separates the much larger islands of Sambawa on the west, and Flores on the east.

**COMORI'N, Cape**, the most southerly extremity of the peninsula of Hindustan, being, in fact, a sandy accretion to the termination of the Western Ghauts; while, on the outside of it, are a few detached rocks as a natural breakwater. The headland itself is so low as not to be visible at the distance of more than ten miles from the deck of a large ship; and, long before it can be itself distinguished, it is fixed in position, to the eye of the approaching mariner, by a conspicuous peak of the great chain behind it. Its lat. and long. are 8° 5′ N. and 77° 37′ E. Cape C. is in the protected principality of Travancore; and close to it there stands, amid a clump of trees, a village of the same name, with a few fishermen's huts, some venerated temples, and a Dutch church.

**CO'MORN**, properly **KO'MORN**, a town and fortress in Hungary, situated on the island of Schütt, at the junction of the Waag and the Danube, which is here crossed by a bridge of boats, about 50 miles west-north-west of Pesth. This island is remarkable for fertility, as is, indeed, the whole surrounding district. The town, which is irregularly built, with narrow gloomy streets, contains 17,900 inhabitants, almost exclusively Magyar. The fortress was erected by Matthias Corvinus, and was restored at great expense in 1805. Its works and intrenchments extend about seven miles along the banks of the rivers, and it requires for its defence at least 15,000 men and 400 pieces of artillery. It has the reputation of being impregnable, and justified it in the Hungarian war, for the Austrians besieged it in vain from October 1848 to September 1849, and only became masters of it at last in virtue of a capitulation. It has manufactures of woollen and leather, and an active trade in corn, wine, honey, fish, and timber.

**CO'MORO ISLES**, a group of four islands in the Mozambique Channel, between Africa and Madagascar, in lat. 11°—13° S., long. 43°—45° 30′ E. The islands, which are of volcanic origin, are called Angaziya or Great Comoro, Anjouan or Johanna, Mayotta, and Mohilla. They are mountainous, the highest peaks rising above 6000 feet. The soil is fertile. The inhabitants, about 80,000 in number, are principally Mohammedans, but fetichism prevails to some extent. The manufactures are coarse cloths, jewellery, and firearms. From the report of the British consul stationed at Johanna, it appears that in 1857 that island imported British and American manufactured goods to the value of £4500. The exports were small, confined mostly to hides, cowries, and cocoa-nuts, with ten tons of sugar, the first exported from the island. The people found their principal employment in connection with ships calling for provisions. The trade of Comoro and Mohilla was of the same character, but these islands were not so much frequented by ships for the purpose of victualling.

**COMPANIES' CLAUSES CONSOLIDATION ACT.** See Railway.

**CO'MPANY.** See Joint-stock Company and Partnership.

**COMPANY**, in Military Organisation, is an aliquot part of a regiment or battalion. In the British service, the companies in an infantry regiment are generally either ten or twelve, or, if there are two battalions, each has this number of companies. The arrangement is made to facilitate command and evolutions. The captains, lieutenants, and ensigns are all *C. officers.* The captain is the chief of a C., and the lieutenant and ensign are his subalterns or assistants. The C. is further separated into two *subdivisions*, of two sections each. In round numbers, and without reference to special instances, a full C. may be considered to comprise about 100 men, a subdivision 50, and a section 25. Under the captain's superintendence, the lieutenant commands the first and second sections, the ensign the third and fourth, with a sergeant to each section. Each C. has its own arm and accoutrement chests, and keeps its own books.

The subdivisions of a cavalry regiment are into *troops* instead of companies. In order that no confusion may arise from different uses of the same term, the word C. is gradually becoming disused in the artillery, and replaced by *battery.*

**COMPANY**, of a ship, is considered to include the whole of the persons engaged on board, and paid for specific duties—exclusive, therefore, of troops and passengers, but including naval officers as well as crew. See Crew.

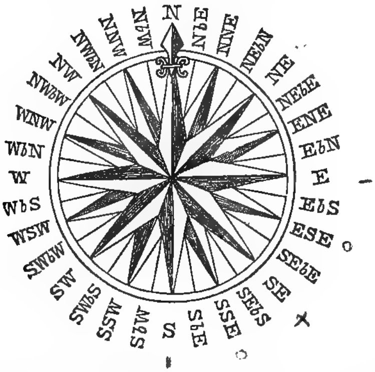
**COMPA'RATIVE ANA'TOMY.** See Anatomy.

**COMPA'RISON**, in Grammar, and as applied to Adjectives (q. v.), is that which marks the *degree* in which the quality is attributed to the object, as compared with other objects. There are three degrees of comparison. The *positive* indicates the quality generally, without comparison; the *comparative*, a higher degree of the quality than is attributed to other things; and the *superlative*, the highest degree that is attributed to any of the things under consideration. There are two ways of expressing these degrees. 1. By an inflection or change on the word; as, *hard, harder, hardest; happy, happier, happiest.* This mode prevails almost exclusively in Greek and Latin. 2. By an additional word, as *more happy, most happy.* This may be called logical C.; the other, grammatical. In French, with the exception of a few irregular adjectives, all adjectives follow the logical method. In English, the logical method is preferred in every case where the grammatical would produce a word difficult or harsh in the pronunciation. This is generally the case in English when the simple adjective is of more than one syllable; but it is not always so. Thus, *eárnester, prúdenter,* would make harsh combinations; not so *políter, discréeter, háppier.* The difference is, that in *eárnester, prúdenter,* the accent being on the first syllable, two unaccented syllables of discordant character are thrown together; in *políter, discréeter,* the unaccented syllables are separated; and in *háppier,* though they come together, they are of a kind readily to coalesce. Thus, the laws of euphony —which mean, the ear and organs of speech consulting their own convenience—determine this point, as they do much else in language. In general, it is only adjectives of quality that admit of C.; and even adjectives of quality cannot be compared when the quality does not admit of degrees; as, a *circular* space, a *gold* ring, a *universal* wish.

Adverbs (q. v.) are compared exactly like adjectives.

**CO'MPASS**, Mariner's, is the name given to the instrument by which sailors are enabled to steer their course on the ocean out of sight of land, and when neither sun nor stars are visible. The ancients, to whom it was unknown, could seldom venture to lose sight of the coast. The directive power of the magnet seems to have been unknown in Europe till late in the 12th century. It appears, however, on very good authority, that it was known in China, and throughout the East generally, at a very remote period. The Chinese annals indeed assign its discovery to the year 2634 B.C., when, they say, an instrument for indicating the south was constructed by the Emperor Hou-ang-ti. At first, they would appear to have used it exclusively for guidance in travelling by land. The earliest date at which we hear of their using it at sea is somewhere about 300 A.D. According to one account, a knowledge of the C. was brought to Europe by Marco Polo, on his return from his travels in Cathay. It was long contended that the C., as a nautical instrument, was first invented by Flavio Gioja, a native of Amalfi, about the year 1362; and that that part of the kingdom of Naples where he was born has a compass for its arms. For this there is no authority whatever, as the C. was well known as a nautical instrument before his time. It is probable, however, that Gioja may have made some improvement in the instrument or in the mode of suspending it. See *British Annual for* 1837.

The essential part of the C. is the magnetised needle, balanced freely upon a fine point; such a needle has the property of arranging itself in the meridian, one end always pointing to the north, and the other to the south (see Magnetism); yet not exactly, but with a deflection or *declination* (q. v.), which varies from time to time in magnitude, and may be towards the west or the east. The form of the needle is various, some being long flat prisms, others lozenge-shaped. The centre of the needle is pierced, and a piece of agate generally inserted, with a conical hole sunk in it, to receive the fine point of the steel pin, so that the free motion may not be hindered by friction. The construction of the rest of the instrument depends upon the purpose it is to serve. For a mariner's C., the needle is fixed to a circular card, on which there is a star of 32 rays (see the figure), marking the 32 *points* of the heavens. The north point of the card is immediately over the north end of the needle, and the card moves with the needle. The cardinal points are marked with the letters N., S., E., W.; and the intermediate points, by an ingenious system of notation, the principle of which is readily seen by inspection of the figure. The points are often subdivided into quarters, which are thus marked: N.$\frac{1}{4}$E. (read, 'north one-fourth east'); N.$\frac{1}{2}$E.; N. by E.$\frac{3}{4}$E., &c. A point of the C., being $\frac{1}{32}$ of the circle, is equal to 11° 15'. The C. thus formed is enclosed in a cylindrical brass box; and in order that the C. may remain horizontal in all positions of the ship, the box is suspended by Gimbals (q. v.). The whole is then placed in the Binnacle (q. v.), in sight of the helmsman. Inside the box, in the direction of the ship's bow, is a vertical black line called the *lubber-line*, and the steersman must keep the point of the card which marks the prescribed course always in contact with the black line. Compasses differing in some respects from the mariner's C. are also used in surveying and land-measuring; and for the miner they are perhaps as necessary as for the sailor.



The great difficulty connected with the use of the mariner's C. arises from the disturbing influence of the magnetism of the ship. This difficulty is particularly felt in iron vessels, where the deviation of the needle is frequently so considerable as to render the compass almost useless. Various means of obviating this have been suggested; one of these is to place bars of soft iron or magnets in the immediate neighbourhood of the binnacle, which being so placed as to cause a contrary disturbance to that of the iron of the ship, leave the needle comparatively free. This is found to answer well in iron ships plying between British and continental or North American ports; but where, as in the Australian passage, they change considerably their latitude, such an arrangement is found to be worse than useless, as the magnetism of the vessel changing with the magnetic latitude, causes an ever-varying deviation of the needle. It has likewise been suggested to place a compass as a standard at the mast-head, where it would be comparatively free from the attraction of the vessel, by which the ship's course might be shaped, the ordinary C. being used merely to give immediate direction to the steersman. In the royal navy, this error is to a large extent obviated in the following way. A C. is placed so high above the deck as to clear the bulwarks, and allow the bearings of a distant object on shore or a heavenly body to be taken while the ship's head makes a complete circuit. In this way, the deviation caused by the iron of the ship in all different positions may be ascertained, and afterwards taken into account.

**COMPASSES**, instruments for transferring and marking off distances, or for drawing circles, ellipses, &c. The *common C. or dividers* are simply two rods or 'legs' joined together at one end by a pivot-joint, and pointed at the other; when used for drawing circles, the lower part of one of the legs is replaced by a pen or pencil. *Spring dividers* are much in use by workmen; in these, the legs are united by a strong steel spring, the action of which is to stretch them open; but half-way down, a screw passing between the legs, regulates the degree of opening. The value of these depends upon the permanency with which they retain any degree of opening given to them, pivot C. being liable to slip.

*Beam C.* consist of points sliding on a long bar, to which they may be clamped at any distance from each other. They are used for greater openings than pivot C. can safely span, and, when delicately made, for more accurate dividing. See Dividing Engine.

*Proportional C.* have a point at each end of each leg and the pivot between, thus forming a double pair of C. opposite to each other, end to end. If the pivot is midway between the points, the opening of each pair of points will be equal; if the distance from one pair of points be double that from the other, the openings will be as two to one; and so on for any ratio. When a single fixed proportion only is required, the pivot is fixed accordingly; but to adapt them for variable proportions, the pivot is a clamping screw, which moves in an elongated interval in the legs, and may be fixed at any point.

*Triangular C.* have three legs, so that the points of a triangle may be all transferred at once.

*Calliper Compasses.* See Callipers.

**COMPA'SSIONATE ALLOW'ANCE** is a gratuity which arose out of the sympathy of the nation with the British army during the Crimean war. By royal warrants, issued at different times in 1855 and 1856, an allowance is made to the widows and children, or to certain other specified relations, of military officers who, since the date of the declaration of war with Russia, have been killed in action, or have died of wounds received in active service. If the allowance be in the form of a gratuity, in one sum of money, it bears a certain definite relation in amount to the sums which the officer had paid for the purchase of his commission; but the recipients have the alternative of a pension or annual allowance. Very stringent conditions are laid down to entitle any family to this C. A., seeing that it is a costly, though just arrangement.

**COMPENSA'TION** (Lat. *compensatio*). The doctrine of C., which the law of Scotland and of most of the other states of Europe have borrowed from the civil law of Rome, corresponds to that of *set-off* in England. It provides that where two parties are mutually debtors and creditors, their debts shall extinguish each other, if equal, and if unequal, leave only a balance due. C. must be pleaded, as it does not operate *ipso jure*, but, when pleaded, it is held to operate from the period of concourse, the interest on either side being stopped from that time.

*Compensatio Injuriarum* is a defence against actions of damages for slander or the like. It is not a bar to action, but a *set-off* or counter-claim. In England, it is not allowed to set-off one trespass or tort against another—a cross-action is requisite; and in Scotland, the leaning recently has been in the same direction.

**COMPENSATION OF ERRORS**, in Physics, a method of neutralising errors which cannot be avoided, by introducing others into the experiment or observation, of an opposite nature, and equal in amount. The compensation pendulum illustrates the principle. See PENDULUM.

**COMPETI'TION** (Lat. a seeking together) has been well defined by Dr Johnson as 'the act of endeavouring to gain what another endeavours to gain at the same time.' Its most apt exemplification is a race, where all are going to the same point, and all strive to be first there, while though only one can achieve this object, some others will have the satisfaction of being nearer to success than the competitors who are behind them. The most important practical use of the word C. is in the political economy of commerce, where it is the great motive-power of production and enterprise. People work, or embark in trade, avowedly for the purpose of making money. It is the object of the law of the land, as well as of religion and morality, to prevent money-making by immoral means; but within the bounds thus drawn around it, money-making is the object of man's exertion. When the money is made, the next point, always within the same bounds, is to make it go as far as it will. C. works through the co-operation of these motives. The purchaser wants the best article he can get at the lowest price; the producer strives to beat all his fellows, and offer the best article for the price. So thoroughly is this principle established as one consistent with commercial morality and honour, that our railway companies, managed by men of rank and fortune, many of whom are members of the legislature, do not hesitate to make travellers pay a larger fare for going 20 miles on their line to a station not touched by a rival company, than they will charge the same passenger for a journey of 40 or 50 miles, if it be to a station which he could reach otherwise.

Whatever may be hereafter accomplished, what we chiefly know of the attempts to supersede C. by some other motive to exertion, is, that they have not been successful. We see every day C. increasing the necessaries and comforts of life, and enlarging the wealth of the community. It is said that there are other and better motives which should produce the same effect, but they have not yet been found. It was an object of the ruling party in the French provisional government of 1848 to abolish C., and place all workmen on a par, as some expressed it, or, according to others, to remunerate them, not according to their services, but according to their wants. A great experiment was tried at the Hôtel Clichy, where 1500 tailors were employed to make the uniforms for the national guards, the price of which was to be equally divided among the workmen; but even in that climax of enthusiasm, they did not work up to the mark of the lowest paid of the Paris tailors under the competitive system. As each one felt that the value of any extra exertion would be divided among the whole 1500, instead of being enjoyed by himself, his zeal relaxed, and even the thought of 'liberty, equality, and fraternity' was insufficient to rouse it. It appears wonderful that large bodies of the French people should have been so easily deceived by statements of which the fallacy, or rather the actual inaccuracy, would be at once seen through by any working-man in this country. Louis Blanc supposes three competitors for a job. A has a wife and family; he wants 3 francs of wages. B has a wife only; 2½ francs will do with him. But C is a bachelor, who can subsist on 2 francs; therefore, he gets the job, and the others starve. See the second chapter of his *Organisation du Travail*, the title of which is, 'Competition is for the People a System of Extermination.' But he leaves out entirely one side of the bargain. Employers compete to get work as much as workmen compete for employment. If the work of B and C be worth, in the market, 3 francs, they will get that whether they have families or not; and it is not the practice of a working-man, any more than of the rest of the human species, to give his work at a third less than its value because he is a bachelor. The Socialists have referred to the public departments—especially to the post-office arrangements in Britain—for instances of services performed without competition. There is, however, in reality, much C. in all the government departments. Although tradesmen may not endeavour to undersell each other by making goods and offering them to the government, yet they endeavour to undersell each other by offering to undertake contracts at the lowest price. Doubtless, the practice of entering on government-contracts is open to abuse, if the officers who look after them are careless, and neglect the detection of fraud or inefficiency. But the service of government by contract may be made as effective as any other kind of competition.

There are circumstances in which it is necessary to dispense with the external form of C., but where its influence still rules. For the convenience of the public—especially of travellers—rates of fares are established for cab-drivers, porters, ferrymen, and the like. These men cannot be forced to undertake such functions: they do so because it pays them. Instead of making a separate contract for each job—an arrangement open to fraud and inconvenience—they make a general bargain with the public to serve all-comers. The rate of remuneration they receive ought to be the closest possible approximation to what C. would fix. Whether it is so or not, can be easily tested. If men do not come forward in sufficient numbers to serve the public, then the fixed rate is too low; on the other hand, if there is a superfluity of hands, a percentage of them being at all times unemployed, it is clear that the rate is too high, and that even partial employment in the line is sufficient to induce men to leave other occupations.

One of the most plausible arguments against free C. is, that it throws away labour by producing more goods than are required. Five hundred hats are wanted, but a thousand are produced, and therefore half of them are wasted. In some such shape, the folly and waste of C. are generally illustrated by continental writers. It is very rarely that dealers are so utterly blind to the demand for the article in which they trade. It must be admitted, however, that C., like all other useful things, has its peculiar abuses, and of these perhaps the chief is the propensity which some tradesmen have to carry rivalry to the extent of vicious excitement, and to endeavour rather to get the better of each other than to make their separate fortunes. From this spirit, it frequently happens that when one man has established a successful business in some new locality, another, instead of trying a different business in the same place, or the same business in some other and similar place, sets himself down as a rival, and ruins both. One sets up, for instance, a grocery-shop in a new suburb; he succeeds, but there is not business enough for two; and if a rival sits down beside him, both are ruined; whereas the success of the grocery should rather have hinted that a butchery or a bakery might have a good chance in the same place, or a grocery in some other suburb of similar character. Speculators in omnibuses and other horse-hired vehicles are signally liable to this sort of rivalry, often seeming unable to endure the sight of a brother of the trade driving a good, quiet, tolerably paying business.

C. for public offices—that is to say, the appointment to them of those young men who have shewn the highest proofs of ability according to certain tests—has so recently been adopted, that there is little opportunity of judging of its effects. But it must be kept in view, that this is something quite different from the kind of C. referred to above. Clever men may be secured to the public service by such a test, but it is clear that the motive for these clever men, as well as other public servants, doing their duty, must be something in the shape of promotion or otherwise, which will have a constant influence on them after they are appointed. See EXAMINATION.

**COMPIÈGNE**, a town in France, in the department of the Oise, stands on the river Oise, a little below its junction with the Aisne, and 33 miles east-south-east of Beauvais. A fine stone-bridge crosses the river at this point. The town, which is irregularly built, has a tribunal of the first instance, and one of commerce. The inhabitants, numbering 8767, are employed in hosiery, rope-making, boat-building, and in traffic in wood and corn. But what best deserves observation at C. is the magnificent palace, built anew by Louis XV., and splendidly fitted up by Napoleon, who often occupied it. It contains a library, a picture-gallery, and other objects worth seeing. The park is extensive, and adjoining the gardens is the beautiful forest of Compiègne, extending over about 30,000 acres. C. is mentioned in the times of Clovis under the name of *Compendium;* and it was the seat of several political assemblies and ecclesiastical councils. It was at the siege of this town, in 1430, that the Maid of Orleans was captured; and here, in 1810, Napoleon and Maria Louisa of Austria first met, on occasion of their marriage.

**CO'MPLEMENT** is that which completes or makes up a given magnitude to some fixed magnitude. It is most commonly used in mathematics, to signify the arc or angle by which a given arc or angle falls short of a quadrant or right angle: thus, the C. of an arc of 60° is one of 30°; and that of 30° is one of 60°.—The arithmetical C. of a number is the number by which it falls short of the next higher number expressible by tens: thus, the arithmetical C. of 64 is $100 - 64 = 36$.

**COMPLEMENT**, in Music, the quantity required to be added to any interval to complete the octave; for example, a fourth is the C. of a fifth, a third is that of a sixth, &c.

**CO'MPLINE.** See CANONICAL HOURS.

**COMPO'NÉ**, or **GOBONY**, in Heraldry. When a bordeur, pale, bend, or other ordinary, is made up of two rows of small squares, consisting of alternate metals and colours, it is called componé.

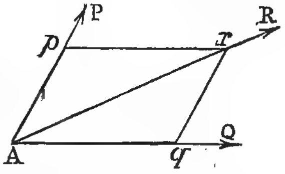
**COMPO'SITÆ** (called by Lindley ASTERACEÆ, and by some botanists SYNANTHERÆ), a natural order of exogenous plants, distinguished by *compound* or *composite flowers*, i. e., heads of flowers which are composed of a greater or smaller number of florets (generally of small size) congregated upon a common receptacle, and surrounded by bracts which form a leafy or scaly involucre, so as to resemble single flowers, which name they ordinarily receive. Another very marked characteristic is, that the anthers of each floret cohere into a cylindrical tube. The order contains both herbaceous plants and shrubs; those which are natives of cold climates being generally herbaceous, and those found in warm regions shrubby, or even arborescent. They have alternate or opposite leaves, without stipules. The florets are either unisexual or hermaphrodite—those of the circumference (or ray) often differing in this respect, as well as in form and colour, from those of the centre (or disc) of the same head. Bracts (*paleæ*) are often interspersed with the florets upon the receptacle. The calyx is superior, closely adhering to the ovary, and essentially united with it, and afterwards with the fruit, its limb either obsolete or membranous, crowning the ripened fruit, often divided into bristles, hairs, and feathers, which form a PAPPUS (q. v.). The corolla is of one petal, superior, either strap-shaped or tubular, both forms often appearing in different parts (ray and disc) of the same flower (or head) sometimes 2-lipped, very often 5-toothed. The stamens are equal in number to the teeth of the corolla, 4 or 5, and alternate with them. The ovary is 1-celled, with a single erect ovule; the style simple, with 2 stigmas; the fruit dry and not opening (see ACHENIUM); the seed destitute of albumen.—This is the largest of the natural orders of flowering-plants, containing upwards of 1000 genera, and almost 10,000 known species. They are distributed over all parts of the world; but increase in number from the poles to the tropics, and thence, again, diminish towards the equator. In the Linnæan sexual system, they form a distinct class, SYNGENESIA. Jussieu subdivided the order into three sections, and although other subdivisions have been proposed, these are generally recognised as sub-orders—CYNAROCEPHALÆ, having the florets all tubular; CORYMBIFERÆ, having a disc of tubular florets, surrounded by a ray of strap-shaped florets; and CICHORACEÆ, having all the florets strap-shaped. The *Cichoraceæ* abound most in cold, and the *Corymbiferæ* in warm climates. The Artichoke and Thistle are familiar examples of the *Cynarocephalæ;* the Daisy, Aster, Dahlia, Chrysanthemum, Chamomile, and Sunflower of the *Corymbiferæ;* and the Dandelion, Chicory, and Lettuce of the *Cichoraceæ.* By cultivation, many of the *Corymbiferæ* are changed so that the florets of the disc assume the same appearance with the florets of the ray, as may be seen in the Dahlia, Chrysanthemum, Aster, &c., and they are then said to be double, although the change which they have undergone is very different from that which has taken place in double flowers of other kinds. The C. are not, in general, of very great importance in domestic economy or in the arts, although many of them are among cultivated and useful plants. Only a few, as the Artichoke, Scorzonera, Salsafy, Jerusalem Artichoke, Endive, and Lettuce, are used for food, and these are of inferior importance in that respect. A very few, as Safflower and Saw-wort, afford dye-stuffs; and a very few, as the Jerusalem Artichoke and Chicory, are occasionally cultivated for food of domestic animals; the use of chicory-root as a substitute for coffee is well known. From the seeds of some, a bland fixed oil is expressed—the Sunflower, Madia, and Ram-til being the most important. Many are valuable for their medicinal properties, as Chamomile, Arnica, Wormwood and some other species of Artemisia, Elecampane, Tussilago, Blessed Thistle, &c. Many are characterised by bitterness; stimulating properties are of frequent occurrence; also anodyne, diaphoretic, diuretic, and narcotic properties. Some, as Arnica, are very poisonous. A large number are esteemed ornaments of our flower-gardens, particularly in the latter part of summer and in autumn. Amongst these, the Dahlia perhaps holds the first place; and others, scarcely less admired, belong to the genera Aster and Chrysanthemum. The wood of the Siriehout (*Tarchonanthus camphoratus*), a small tree of the Cape of Good Hope, is close-grained, heavy, and very beautiful.

**CO'MPOSITE O'RDER**, in Architecture. See Column.

**COMPOSI'TION**, in Art, signifies such an arrangement of the separate objects represented as that they shall all manifestly tend to bring out the centre thought or idea which animates the whole. Episodes and digressions are less admissible in æsthetic works of art than in poetry, and less in plastic art than in painting. In all works of art, it is to be borne in mind that the story is to be told to, and apprehended by the eye alone. There is no surer proof of failure in æsthetic C. than when a picture is found to be totally unintelligible, even to intelligent persons, without the aid of a description in a catalogue. Rules are of little or no avail in this matter. There is but one canon of universal application—viz., that the artist should, in the first place, make it clear to his own mind what his work is to express; and that he should then consider by what arrangement of the objects that must, or may, be introduced into the picture, this will be best accomplished.

**COMPOSITION**, in Bankruptcy, a certain sum per pound which creditors agree to receive from a bankrupt in lieu of full payment of his debts, and the acceptance of which operates as a discharge to the bankrupt, and reinvests him in his estate. In a private settlement, the acceptance of a C. bill, unless the contrary be stipulated, only entitles the creditors to rank for the C., and not for the full amount, in the event of a second bankruptcy. If no C. bill be accepted, and there be no accession to a C. contract, it has been held that the creditor may, in a second bankruptcy, rank for his full debt. In a Scotch sequestration, the bankrupt must find security for payment of the C. to the satisfaction of a certain proportion in number and value of the creditors, which proportion varies according to circumstances. The cautioner is only bound for two years, but recourse against the bankrupt is unlimited. In a private settlement, an individual creditor may refuse a C.; but in a sequestration, the majority binds the minority to accept. If the bankrupt and his cautioners cannot meet a sequestration C., their estates are only liable for the C. amount.

**COMPOSITION AND RESOLUTION OF FORCES AND MOTIONS.** 1. The fundamental problem in statics is to find the magnitude and direction of the *resultant* of two forces; in other words, to compound them into a single force, which shall be in every respect their equivalent. Intensity and direction being the only elements necessary to entirely describe a force, forces in statics are represented by lines, which are obviously capable of being made to represent them both in magnitude and direction. When two forces act along the same straight line on a particle, it is sufficiently obvious that if they act in the same direction, the resultant will be their *algebraical* sum; if in opposite directions, their *algebraical* difference. This being premised, the relation between two forces acting at the same point, but not in the same line, and their resultant, is set forth in the following theorem, which is known as the *Parallelogram of Forces:* If two forces, P, Q, acting on a particle A, be represented in direction and magnitude by the lines A*p*, A*q*, then the resultant will be represented in direction and magnitude by the diagonal A*r* of the parallelogram described upon A*p*, A*q*. The proof of this depends upon the simple principles, that a force may be supposed to act at any point of its direction, that point being conceived to be rigidly attached to the particle on which the force acts; and what may be accepted as an axiom of universal experience, that when any number of forces are impressed on a particle or body, each exerts itself, as if the others were not acting, to produce its full effect. See any elementary treatise on Mechanics. The doctrine of the parallelogram of forces has given rise to much controversy, not as to its truth, but as to its derivation, some appearing to contend that it is directly deducible from the axiom above stated, without the necessity of further reasoning.—Knowing how to compound two forces acting at a point, we are able to compound or determine the resultant of any number. If the forces, though in the same plane, do not act at the same point of a body, those of them whose directions meet may be compounded by the preceding rule; if they are parallel, their resultant is a force parallel to them and equal to their algebraical sum, counting those acting in one direction as positive, and in the opposite direction as negative. For the position of the resultant in this case, see Parallel Forces. The singular case is that of equal parallel forces acting in opposite directions. These constitute a couple, and cannot be represented by any single force. See Couples.



2. The resolution of forces is the converse problem. To resolve a given force R, whose direction and magnitude is A*r*, into two forces acting in any directions that may be chosen, as AP, AQ, we have only to draw parallels through *r*, which determine the lines A*p*, A*q*, representing the magnitude of the forces required. It is evident that there is an indefinite number of pairs of forces into which A*r* might be resolved, according to the direction in which the new forces are to act. It is usual, however, to resolve a force into forces that are at right angles to each other.

3. The composition of motions is analogous in every way to that of forces; motions are the results of forces, and the analogy might be expected. If a body be actuated simultaneously by two velocities having different directions, it will evidently move in a direction intermediate to the two, and with a velocity which will in some way depend on each of them, and which is called their resultant. The proposition which sets forth how to find the resultant, is called the *Parallelogram of Velocities.* It is: If two velocities, with which a particle is simultaneously impressed, be represented in direction and magnitude by two straight lines drawn from the particle, the resultant velocity of the particle will

be represented in direction and magnitude by the diagonal of the parallelogram described on those two straight lines. The proof is very simple. There is no reason why the full effect of both velocities should not be produced, as if the body moved first with one of them, and then with the other in their respective directions. If in one *second* the body moving with the one velocity would reach *p*, and if we suppose it then to move on *pr* for another second, parallel with the other velocity, it would at the end of the second second be at *r*. Hence, under their joint influence, it will be at *r* at the end of one second.

4. The resolution of motions is altogether analogous to that of forces.

**COMPO'SITOR.** See Printing.

**COMPOS MENTIS.** See Insanity.

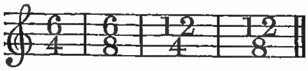
**COMPOSTE'LLA,** Military Order of St James of. St James, the elder, was adopted as the patron saint of Spain, after the victory of Clavijo, and his relics were preserved at Compostella, the capital of the province of Galicia. The marvels supposed to be performed by these relics, drew vast numbers of pilgrims, for whose support hospitals were established by the pious canons of St Eloy. The vicinity of the Moors having subsequently rendered the high-roads unsafe, thirteen noblemen united for the protection of the pilgrims, and, in conjunction with the canons, resolved to found an order of the same kind as that of the Hospitallers or Templars. The pope granted his assent in a bull, dated 5th July 1175, accompanied with the statutes of the order. Whatever conquests were made from the infidel were declared the property of the order, and a council of thirteen knights was vested with authority to elect and depose a grand master. The knights made vows of poverty, obedience, and celibacy, and professed their belief in the immaculate conception. To protect Christians, and convert infidels, they vowed to be the only object in their wars with the Saracens. In most of the great battles between Christian and Moor, the red cross of the order was conspicuous. The conquests of the order itself, combined with the grateful munificence of the nation, speedily increased its wealth and power beyond those of any of the other orders of knighthood. In addition to the three large commanderies of Leon, Castile, and Montalvan, it possessed nearly 200 minor commanderies, comprising, it is said, more than 200 priories, with many fiefs, cloisters, hospitals, castles, boroughs, two towns, and 178 villages, exclusive of its possessions in Portugal. This enormous wealth and power of the order excited the jealousy of the crown, in which, in 1522, the grand mastership was permanently vested by the pope. Having thus become merely honorary and dependent on the crown, the order rapidly decreased in importance.

Cross of the Order Compostella.

**CO'MPOSTS** are a kind of Manure (q. v.), consisting of mixtures of substances adapted to the fertilisation of the soil, which being allowed to ferment, and undergo chemical changes for a considerable time in heaps, become more valuable than they were at first, or ever could have been if applied separately. C. were formerly made of farm-yard manure, and earth or lime in addition. Road-scrapings, peat-moss, leaves, and clearings of ditches, also formed materials for the purpose. By allowing these to lie in heaps for six months, of from three to four feet in depth, food was prepared for plants. The mass was usually applied to the turnip-crop, and when artificial manures were unknown, considerable benefit arose from such dressings. The use of guano and other light manures has superseded in a great measure the necessity of this laborious process, and C. for the turnips or barley-crops are now little used. The wonderful effects that have resulted from the application of small doses of nitrogen and phosphoric acid, have impressed farmers in general with the truth, that the most energetic elements bear a small proportion in weight to the whole mass of farm-yard dung or C., and that the mixing of manures in heaps with earth does not so much add to its virtues as to repay the labour expended in the process. More care is now rightly bestowed in preserving manure from washings by rain. C. formed of leaves, ditch-scourings, road-scrapings, or any earthy matter containing a large percentage of vegetable matter, with the addition of lime, may still be used with benefit for pastures that are deteriorating, or where the soil is stiff. Where moss prevails, lime should enter largely as a component. On the other hand, where the soil is of a strong and clayey nature, earthy substances containing vegetable matter in larger proportions should be used. Vegetable matter has the effect of imparting a softness to the surface, that is particularly conducive to the free growth of pastures. Compost made of turf, leaves, earth, and bone-dust is used with great benefit by gardeners for vines and fruit-trees which are injured by too concentrated manures.

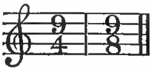
**CO'MPOUND A'NIMALS** are those animals, exclusively of the lowest classes, in which individuals distinct as to many of the powers of life, are yet united in some part of their frame, so as to form one living system. Examples of this union are found in many animalcules and zoophytes, also in cestoid worms and ascidian mollusks. The whole living system in all C. A. appears to originate from a single egg or germ, and each is at first simple; the subsequent multiplication of individuals, having distinct organs, but permanently retaining their connection with the system, has some analogies with some of the modes of true reproduction. It is important, also, to observe that many C. A. exhibit very close relations to other animals which in no degree possess this remarkable character. The subject of C. A. is in many respects an extremely interesting one. This occasional peculiarity in animal life may perhaps be regarded as affording some countenance to the theory of Darwin concerning plants, that each bud is to be accounted a distinct individual. But the term individual must be modified in its sense, when applied to the buds of a tree, or the polypes of a polypidom.

**COMPOUND COMMON TIME,** that species of measure containing the value of two dotted minims in a bar, or two dotted crotchets, marked thus:



**COMPOUND INTEREST.** See Interest.

**COMPOUND TRIPLE TIME** denotes a measure of nine crotchets or quavers in a bar, and is marked thus:



**COMPOU'NDING OF FE'LONY,** in England, is the offence of taking a reward for forbearing to prosecute a felony, and is punishable with fine and imprisonment. Compounding of informations upon penal statutes, and compounding of misdemeanours, are also illegal, unless with leave of one of the courts at Westminster, and are punishable in a lighter degree. But in misdemeanours affecting the person only, as assaults, &c., an inferior magistrate will often permit the defendant to make the prosecutor some pecuniary amends, and thereupon remit the public punishment. A species of C. of F. is the advertising a reward for stolen property, coupled with words implying that no questions will be asked, or that no prosecution will be instituted, or that a pawnbroker returning the property will be paid what he has advanced for it; and this offence, by 7 and 8 Geo. IV. c. 29, is punishable by a fine of £50, on the advertiser, publisher, and printer. The 8 and 9 Vict. c. 47 (often called Bishop's Act, from the name of the gunmaker in Bond Street) applies a similar rule to the case of stolen dogs.

**COMPRE'SSED-AIR BATH**, a large chamber in which patients sit under increased atmospheric pressure for a greater or shorter period. An attempt at this kind of treatment was made as early as 1662 by Dr Henshaw, but failed, owing to the imperfection of the apparatus. The apparatus, as now used, is the invention of M. Emile Laburié of Paris, who in 1832 conducted a series of careful experiments upon the effects of the atmospheric air at different densities upon the human frame. The bath is a chamber 9 feet in diameter, and 12 feet high; it is constructed of iron plates rivetted together like those of a boiler of a steam-engine, so as to be perfectly air-tight; it is provided with two close-fitting iron doors, which can be opened without affecting the pressure of the air within the chamber; the interior is lined with wood, and furnished with seats; a steam-engine of seven horse-power works a pair of large air-pumps, communicating indirectly with the chamber by a pipe that opens by means of numerous small holes in the bottom of the floor, so that the air enters imperceptibly into the chamber; from the roof, a pipe similarly arranged allows the breathed air to escape. Each of these tubes is supplied with a screw valve, by means of which the inlet and exit of the air are regulated. Two barometers hang on the walls of the chamber, to shew the rate of increase and decrease of pressure. The pressure is raised at the rate of one pound every four minutes, and the lowering takes place at the same rate. The pressure is usually raised to seven pounds per square inch—in addition, of course, to the usual pressure of the atmosphere. The period generally prescribed for patients to remain in the bath is two hours.

The diseases in which the C. B. is said to be most efficient are phthisis, asthma, and chronic bronchitis. The effects are attributed to two causes: 1. A greater quantity of air, and consequently of oxygen, is inhaled in a given time; and not only so, but the amount absorbed is increased in proportion to the pressure of the gas against the walls of the air-vesicles. The increased absorption of oxygen and excretion of carbonic acid enables the lungs to perform their functions more efficiently, and thereby removes any congestion existing in these organs. 2. The increased mechanical pressure of the air upon the mucous membranes, when in a state of chronic congestion, has a bracing effect, and imparts renewed vigour to the entire structure of the lungs and bronchi. At Benrhydding, the C. B. is used in cases of the kind above named, along with the usual appliances of the water-cure.

**COMPRESSIBI'LITY** is that property of bodies by which they admit of being forced or pressed into less space than they formerly occupied. The particles composing bodies are in all cases at greater or less distances from one another; and whatever brings the particles closer together, diminishes the volume or bulk of the body. This may be effected by various agencies, as, e. g., by the withdrawal of heat (q. v.); but the effect is called compression only when it is caused by mechanical force, as by pressure or percussion. All bodies are compressible, but in different degrees. Many solids, especially those of a compact structure, have this property only in a slight degree. It was believed at one time that liquids were incompressible; more accurate experiments, however, have proved that this is not the case; water, for instance, subjected to a pressure of 15,000 lbs. on the square inch, loses $\frac{1}{20}$ of its volume. Gases, on the other hand, are strikingly compressible; by means of a common condensing syringe, a number of cubic inches of air can be forced into the space of one inch. Compression is in almost every instance accompanied by an evolution of heat. When a piston, having a piece of German-tinder attached to the bottom, is forced rapidly to the bottom of a shut condensing syringe, and rapidly withdrawn, the tinder is found ignited.

In a restricted sense, those gases are said to be compressible which, under great pressure, become liquid. This is the case with carbonic acid gas, chlorine, sulphurous acid gas, and others. Atmospheric air and its components have hitherto resisted all attempts to liquefy them; though it is believed that only a sufficient degree of pressure and cold is necessary to make any gas liquid. Carbonic acid and some other gases are liquefied in small quantities by enclosing the ingredients necessary for generating the gas in a strong glass tube, keeping them separate till the tube is hermetically sealed. The gas, as it is produced, is condensed into a fluid by its own pressure, which is aided by keeping one end of the bent tube in a cooling mixture.

**COMPU'LSION.** Acts done or grants made under the influence of C.—i. e., either force or fear—are reducible by the law of Scotland. But the fear must be such as would shake a man of ordinary firmness and resolution. In like manner, the plea of *vis major*—that is, that the individual acted under the influence of power greater than his own—may relevantly be set up as a defence against such offences as rebellion, piracy, &c. See DURESS.

**COMPURGA'TORS** were twelve persons whom the law of our Saxon ancestors permitted the accused to call in proof of his innocency, and who joined their oaths to his. They were persons taken from the neighbourhood, or otherwise known to the accused. It was rather in the character of jurymen than of witnesses that the C. acted, for what they swore to was not their knowledge, but their belief, and the institution belonged to a time when what has since been spoken of as the Saxon jury was taken from the persons in the neighbourhood best acquainted with the matter to be investigated, and when they performed the combined functions of jurors, witnesses, and judges. The system of C. was adopted even in civil actions for debt, and the ceremony of what was called canonical purgation of clerks-convict, was not abolished in England till 18 Eliz. c. 7.

**COMPUTA'TION OF TIME.** See TIME, COMPUTATION OF, in Law.

**CO'MRIE**, a village and parish in the middle of Perthshire, on the Earn, a little east of Loch Earn, and 20 miles west of Perth. It lies amid the very picturesque scenery of the clay-slate band of Scotland, and is noted for frequent slight shocks of earthquakes. It has woollen and cotton weaving, and distilleries.

**COMTE, Auguste**, the founder of the 'Positive Philosophy,' was born at Montpelier in 1795 or 1797. He studied at Paris; and at an early period, it is said, attracted the attention of his companions by the boldness and novelty of his speculations, maintaining that the time was come when philosophy must undergo another great change, such as it had done in the days of Bacon. Mr G. H. Lewes, who regards C. as the Bacon of the 19th c., only much greater, informs us that C. was but *fourteen* when 'the reforming spirit awoke' in him (see *Exposition of the Principles of the Positive Philosophy*, by G. H. Lewes, Bohn, London, 1853). Shortly after this, and while still labouring under the excitement of his new convictions, he became acquainted with St Simon; entered enthusiastically into his theories, which had not a little in common with his own, and which possessed in addition this advantage, that they were the results of matured thinking (St Simon being then between fifty and sixty); and in 1820, was appointed by the master himself to prepare an exposition of the *Politique Positive* of the St Simonian Society. The work did not satisfy St Simon, who deplored the absence of the 'religious and sentimental aspects' of his system. In 1825, on the death of St Simon, C. broke off altogether from his *confrères*, and in after-years, was accustomed to speak slightingly of his old master's abilities. In 1826, C. was attacked by a cerebral disorder, brought on by 'overwork and heart-anxieties.' He recovered, however, and in 1832, was appointed professor of mathematics at the *Ecole Polytechnique*, which situation he was forced to resign in 1852, on account of differences with his colleagues. He died at Paris, September 1857.

C.'s works are—*Cours de Philosophie Positive* (6 vols., Par. 1830—1842; freely translated into English, and condensed by Harriet Martineau, 2 vols., 1853), *Traité Elémentaire de Géométrie Analytique* (1 vol., Par. 1843), *Traité d'Astronomie Populaire* (1 vol., Par. 1845), *Discours sur l'Ensemble du Positivisme* (1 vol., Par. 1848), *Système de Politique Positive* (4 vols., Par. 1851—1854), and *Catéchisme Positiviste, ou Sommaire Exposition de la Religion Universelle* (1 vol., Par. 1852). It is impossible here to do more than state, in the briefest way, C.'s central and governing doctrine. It is this: The race (like the individual) necessarily passes through three intellectual stages—1. The *theological*, in which a supernatural origin is sought for all phenomena, and the *Deus ex machinâ* is the only explanation of events; 2. The *metaphysical*, in which the *sensuously* supernatural is set aside as incredible, and an effort is made to demonstrate the existence of 'abstract forces or entities supposed to inhere in various substances, and capable of engendering phenomena;' 3. The *positive*, in which the mind affirms the futility both of theological and metaphysical inquiries, abandons all vain search after the *causes* and *essences* of things, 'restricts itself to the observation and classification of phenomena, and to the discovery of the invariable relations of succession and similitude which things bear to each other; in a word, to the discovery of the *laws* of phenomena.' This last is the stage at which C. conceives Europe to have arrived. Theology and metaphysics are alleged to be in their dotage, and all the anarchy of modern life to arise from the presence of these disturbing elements. To deliver us from their hurtful influence, C. employs the principles of positivism to organise a new social doctrine, which shall embrace the entire wants of man as an intellectual and emotional being. C. thus aims at being not only the founder of a new philosophy, but also of a new religion, and has even assumed the title of *Fondateur de la Religion de l'Humanité*. His views, which are very original and comprehensive, have excited much attention among thinkers in France, England, and Germany, and obtained not a few ardent adherents.

**CON, or COL**, an Italian particle, meaning 'with,' much used in musical terms, as 'con spirito,' 'con brio.'

**CONCAN**, a territory in the presidency of Bombay, lies between the Arabian Sea and the watershed of the Western Ghauts, in lat. 15° 44′—20° 22′ N., and long. 72° 52′—73° 45′ E. Its length is 330 miles, and it varies in breadth from 25 to 50 miles. The more easterly section appears to be a succession of rocky terraces, of apparently volcanic origin. The maritime portion, averaging an elevation of 100 feet above the sea, rises here and there to far greater heights, partly in isolated hills, and partly in short ranges. The broad estuaries into which the rivers expand were formerly the retreats of pirates. Of the land that is available for cultivation, the larger part is found on the banks of the rivers—the growth of rice in particular being promoted by annual inundations. The chief peculiarity of the climate is, that the south-west monsoon, arrested in its career by the lofty barrier on the east, has been known to yield, in one year, a rainfall of nearly 300 inches. To omit the city of Bombay, as not being on the mainland, the principal towns are Mhar, Junjera, Ratnagheriah, Viziadroog, and Vingoria. It was in 1818, on the fall of the Peishwa of the Mahrattas, that C. became British territory.

**CO'NCAVE.** A surface is said to be C. when lines drawn from point to point in it fall between the surface and the spectator; and convex, when the surface comes between him and such lines. The terms, it is obvious, are mere terms of relation. See Lens and Mirror.

**CONCEA'LMENT**, in Criminal Law. The C. of an offender, after the commission of the crime, with the view of shielding him from justice, is an offence which may be punished arbitrarily; but C., in consequence of an agreement before the crime was committed, involves the concealer in a charge of art and part in the principal crime (Hume, 274, 281).

**CONCEALMENT OF PREGNANCY AND BIRTH.** See Infanticide.

**CONCENTAI'NA**, a town of Valencia, Spain, picturesquely situated on a slope of the Sierra Mariola, 28 miles north of Alicante. It is surrounded by old walls, flanked with towers; has some interesting old buildings; and manufactures of linen, woollen, paper, soap, &c. The fair annually held here is one of the largest in Spain. Pop. 8500.

**CONCE'NTRIC.** Circles are C. when they have the same centre, but radii of different lengths.

**CONCEPCION.** 1. A city near the mouth of the Biobio, the principal river of the republic of Chili, in lat. 36° 50′ S., and long. 73° 5′ W. In 1835, the place was almost destroyed by an earthquake, the cathedral and most of the other public buildings having been thrown down. Still, however, it numbers about 10,000 inhabitants. C., or rather its port Talcahuano, ranks next to Valparaiso as a mart of foreign trade, being largely engaged in the exportation of hides and tallow. In 1851 and 1855, the arrivals and departures, exclusive of the coasting traffic, stood thus:

| | Entered. | | Cleared. | |
|---|---|---|---|---|
| | Vessels. | Tons. | Vessels. | Tons. |
| 1851, . . . | 235 | 62,812 | 223 | 60,192 |
| 1855, . . | 352 | 106,877 | 353 | 106,963 |
| Increase in four years, | 117 | 44,065 | 130 | 46,771 |

—2. The bay of the Pacific Ocean which forms the harbour of the city above mentioned. It affords good anchorage, communicating with the interior by means of the Biobio, and being sheltered from the open sea by the island of Quiriquino.—3. The province of which the city above mentioned is the capital. Occupying the entire breadth between the Andes and the coast, it is bounded on the S. by independent Araucania, and contains 5210 square miles. In 1855, the population amounted to 110,291.

**CONCE'PTION**, in Psychology. See IDEA.

**CONCEPTION, IMMACULATE.** See IMMACULATE CONCEPTION.

**CONCEPTION OF OUR LADY**, an order of nuns, founded in 1484, in honour of the immaculate conception, by Beatrix de Sylva, sister of James, first Count of Poralegro, in Portugal. It was confirmed in 1489 by Pope Innocent VIII., who granted the sisterhood permission to follow the rule of the Cistercians; but after the death of the foundress in 1489, Cardinal Ximenes put the nuns under the direction of the Franciscans, and imposed on them the rule of St Clara. The order subsequently spread into Italy and France. Besides the grand office of the Franciscans, the nuns recite on Sundays and holidays a lesser office, called the office of the Conception of the Holy Virgin. Their dress consists of a white gown, a blue mantle, and a scapulary, on which is worn the image of the Virgin.

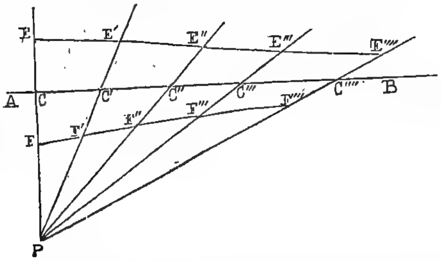
**CO'NCERT**, a musical entertainment of concerted pieces, symphonies, &c., sometimes interspersed with songs, performed by an orchestra of many instruments. C. performances are now established in almost every city in Europe, and societies are formed to foster and encourage the art. Among the oldest institutions of this kind are the Gewandhaus Concerts in Leipsic, established in 1742; and the Concerts Spirituels in Paris, established in 1725. Of more recent institution are the concerts of the Philharmonic Society in London, of the Conservatoire in Paris, and the Symphonic concerts in Berlin, &c.

**CONCERTI'NA**, a musical instrument of modern invention, the sounds of which are produced by free vibrating springs of metal, as in the accordion. The scale of the C. is very complete and extensive, beginning with the lowest note of the violin, G, and ascending chromatically for three-and-a-half octaves to C. Violin music can be performed on the C. with good effect. Every sound in the scale is double, and can be produced either by pulling the bellows open, or by pressing them together. Wheatstone of London is the inventor. Concertinas are now made in France and Germany, but not so perfectly as in England.

**CONCE'RTO**, a musical composition for a solo instrument, with orchestral accompaniments, calculated to give the performer an opportunity to display the highest mechanical skill, as well as intellectual cultivation in the art. The C. consists of three movements, each of which, like the whole, has a certain character, and like the symphony or the sonata, requires a clear development and treatment of the motives, and a strict adherence to the rules of form. When the form is in any way abridged, it is then called a concertino. From the beginning of the last century to the present time, the pianoforte and the violin are the solo instruments mostly used for the concerto. The oldest violin concertos are those by Tartini and his scholars. The French and Germans afterwards improved on these, and fixed the forms, which all the great masters of modern times have adhered to. Innumerable concertos have been written for the pianoforte, amongst which compositions of the most masterly kind are to be found. Concertos for wind-instruments have been less regarded, and are generally written by the performers themselves, and seldom deserve to be called classical works.

**CONCHI'FERA** (Lat. shell-bearing), in Lamarck's arrangement of mollusks, a class containing those which have bivalve shells; *Lamellibranchiata* (q. v.) and *Brachiopoda* (q. v.). The term is still sometimes used.

**CO'NCHOID OF NICOME'DES**, a curve invented by Nicomedes, with the view of trisecting an angle, of constructing two geometrical means between two given straight lines, and of 'doubling the cube.' It is generated as follows: Let AB be any straight line, and P any point not upon it; then let a succession of lines PE, PE′, &c., be drawn, cutting AB in points C, C′, and let CE, CF be laid off from the points of intersection, each equal to a given line: then the curves traced by the successive points E and F form the conchoid. That branch which is above AB, and described by successive points E, E′, is called the first or superior C., and the other branch traced by points F, F′, is called the second or inferior conchoid. Both branches are infinite in extent, and they have the line AB for a common asymptote. AB is also called the directrix, and P, the pole of the curve. The constant distance CE, of the points E and F, from the points of intersection, is sometimes called the modulus of the curve. If we take C in the line EP as origin, and the lines AB and EP, at right angles to one another, as axes, the equation to the C. is $x^2 = \frac{(b+y)^2(a^2-y^2)}{y^2}$, where $a$ is the modulus of the curve, and $b =$ the perpendicular distance of P from AB. The curve may easily be described mechanically, and is frequently used in architecture as a bounding line of the vertical section of columns. The name is Greek, and means shell-shaped.



**CONCHO'LOGY** (Gr. *konchos*, a shell, *logos*, a discourse), the science which treats of shells and of the animals inhabiting them. C., as a science, is at least as old as the days of Aristotle; the study of it was resumed along with that of the other sciences, when the dark ages had passed away; but since the beginning of the present century, it has given place to a more extended and comprehensive study of molluscous animals, now sometimes designated MALACOLOGY; the presence or absence of a shell having been found not to constitute one of the most important characters which distinguish different classes of mollusks. C., indeed, was only the form of the science suited to a time when the shell was more considered than its inhabitant. Yet the relations between shells and the mollusks which possess them are such, that the labours of the merest conchologists have contributed to the real advancement of science, both zoological and geological. It is upon the knowledge of these relations that many of the conclusions of the geologist are founded. In systems of C., shells were usually divided into three orders, *Univalves*, *Bivalves*, and *Multivalves*, according to the number of pieces—one, two, or more—of which they are composed. The first two were established by Aristotle, the third was added in modern times.

**CO'NCLAVE** (Lat.), a word that denotes either the place where the cardinals assemble for the choice of a pope, or the assembly itself. In virtue of the resolutions concerning the pontifical election, agreed upon by the Council of Lyon in 1274, and which are substantially in force to the present day, the C. must consist of a single apartment, having only one door, which is securely locked after the entrance of the cardinals. The necessary food is handed through a window to the members of the C., who are not allowed to leave the place until a new pope is chosen. As the C. is generally held in the palace of the Vatican at Rome, a number of little cells have been erected in one of the galleries, at a short distance from each other. Each of these forms the lodgment of a cardinal for the time being.

A *Conclavist* is a spiritual or secular attendant on the cardinals during the election of a pope. He has to take a vow of inviolable silence, and is not allowed to leave until the important business is concluded, except on the ground of dangerous illness. This office is much sought after, because the successful candidate for the papal chair gives each conclavist three or four hundred livres.

**CO'NCORD**, by English writers on music, is defined as the relation, harmony, or agreement between two or more consonant sounds; such as the union of the major or minor third with the perfect fifth and octave. The German musical technology gives a wider meaning to this term, defining C. as every simultaneous sounding of tones, whether in single intervals or in complete chords, and whether consonant or dissonant.

**CONCO'RDANCE**, a book arranged in alphabetical order, and shewing in how many passages all, or at least all the more important words in any work occur. For writings of universal import, from which passages are continually being adduced to prove or support principles affecting our daily life and action, such a hand-book is indispensable. The necessity of a C. for the Bible seems to have been felt at an early period. The first was executed by Antonius of Padua (b. 1195, d. 1231), who published it under the title *Concordantiæ Morales.* He was followed by Hugo de St Caro (1244) and others, all of whom based their labours on the Latin Vulgate. A Greek C. by Euthalios of Rhodes was prepared about the year 1300, but has been lost. The Alexandrine C. of the Old Testament was compiled by Conrad Kircher in the 16th c., and Xistus Vetuleius published in 1546 a C. of the Greek New Testament, which was republished and amended by Stephens in 1600. In Hebrew, a C. was drawn up by Rabbi Isaac Nathan, in 1438, amended by Marius of Calassio (Rome, 1620), by John Buxtorf (1632), and by Fürst (Leip. 1837—1841). The chief concordances for Luther's translation of the Bible are those of Lankisch, Büchner, Wichmann, and Schott. For the authorised English version of the Bible, the best C. was compiled by Alexander Cruden, and first published in 1737. Among the best editions of this work we may mention those bearing the dates 1810 and 1824. The C. of Parallels, by Crutwell (1790), is esteemed a valuable work. Among secular works of this kind, the *Complete Concordance to Shakspeare*, compiled by Mrs Cowden Clarke (Lond. 1845), is one of the most remarkable.

**CONCO'RDAT**, the name given to a treaty regarding the ecclesiastical affairs of a particular state, between the pope, as head of the Roman Catholic Church, and the temporal ruler of the state in question. The ordinary subjects of concordats have been the rights claimed by the Roman see to appoint to vacant sees and benefices, and to appropriate the whole or a part of the revenues during the vacancy; to receive first-fruits and tithes from those church-livings to which it had appointed; as well as to confer on the clergy generally certain immunities from taxation and civil jurisdiction, and to offer an asylum to criminals. All these claims have been resisted, from time to time, by almost all the Roman Catholic powers, and concordats have very often consisted in a renunciation by the pope of some portion of these his pretended rights. One of the most famous of the earlier concordats was that concluded on September 23, 1122, between the Emperor Henry V. of Germany and Pope Calixtus II., which has ever since been regarded as the fundamental law of the Roman Catholic Church of Germany. Sometimes the popes succeeded in arranging concordats which were favourable to their views; as, for example, that between Leo X. and Francis I., in 1516, which the parliament refused for two years to register, on the ground that by renouncing the right of the chapters to elect the bishops, the king had sacrificed the liberties of the Gallican Church. Since the middle of the 18th c., concordats have generally been adverse to the popes. In 1741, Benedict XIV. gave up to the king of Sardinia both the right of nominating bishops and of reaping the fruits of the Sardinian benefices during the vacancies. But the most famous C. of this class, was that which Bonaparte, as First Consul, forced upon Cardinal Consalvi as the representative of Pius VII., on July 15, 1801, which was ratified in April 1802, and has since regulated the relation of the Gallican Church to the Roman see. By this arrangement, the clergy became subject to the civil power, like laymen, in all temporal matters; and though the pope in matters of discipline had very large powers secured to him, and was still to confer canonical institution, the appointment to all the bishoprics was retained by the government. In 1817, Louis XVIII. concluded a new C., in which he renounced the advantages which the civil had gained over the ecclesiastical power under Napoleon; but the arrangement was exceedingly unpopular with the nation, and in 1819 it underwent considerable modifications. About the period of the Restoration, most of the other Roman Catholic states of Europe concluded concordats, which, in consequence of the reaction then prevailing in favour of the church, were generally in accordance with the principle of the C. of 1516, and consequently more favourable to the pope than the arrangements which they superseded. With the revolution of 1830, a current in the opposite direction set in, and the papacy since has in general lost ground on the occasion of every new concordat. But there has been one very famous exception in our own times—viz., that which was entered into between Rome and Austria at Vienna on the 18th of August 1855; whereby the House of Hapsburg surrendered to the Roman see privileges greater than had almost ever before been conceded by a German sovereign. In this remarkable document, the Emperor Francis Joseph I. promises that the pope shall have direct communication, independent of all surveillance by the civil power, with the bishops, clergy, and people. In like manner, archbishops and bishops are to have free communication with their clergy and their flocks, and to do everything belonging to the government of their sees which accords with canonical law. Under this latter head is comprised the appointment of priests, vicars, and other ecclesiastical officers, the establishment of smaller livings, the power to unite and divide rectories, &c. The whole system of national education, even in private schools, is placed under the control of the church. No one is to teach theology without episcopal permission. In the gymnasia, or higher grammar-schools, none but Catholic professors are to be appointed; and the bishops are to settle what books shall be used. The chief inspector of schools is, no doubt, to be chosen by the emperor, but from among the individuals selected by the bishops. The government binds itself to prevent the dissemination of books pointed out as dangerous to religion by the bishops or archbishops. All questions of marriage, except in so far as they involve civil consequences, are reserved exclusively to the ecclesiastical courts. The point for which the church contended at Clarendon (see CONSTITUTIONS OF CLARENDON), is conceded only in consideration of the times, and priests guilty of crimes are to be tried in the temporal courts; but the bishop must be duly notified of the fact, and it is provided that convicted priests shall be separated from civil delinquents, and imprisoned in a monastery or other ecclesiastical building. The emperor is to choose bishops, but with the advice of the existing bishops and archbishops. As a proof of his extreme liberality, the pope grants the emperor the right of presentation to all livings, when the advowson belongs to religious or educational foundations, on condition that he choose one of three priests selected by the bishop. The church may acquire new property, but once acquired it is inviolable—i. e., it cannot be sold or mortgaged without the consent of both pope and emperor.

**CO'NCRETE** (Lat. *concrescere*, to grow together) is opposed to abstract (see ABSTRACTION). A concrete notion is the notion of an object as it exists in nature, invested with all its qualities, as any particular flower, leaf, or tree; an abstract notion is the notion of any attribute of that flower, leaf, or tree, such as its colour, form, or height; qualities which may be thought of independently of the objects in which they inhere, though they cannot so exist. —The abstract method of handling a subject is adapted to speculation and reasoning; the C., to poetic effect and impressive illustration.

**CONCRETE**, a mixture of hydraulic or other mortar with gravel or shingle, which, on hardening, forms an artificial conglomerate. The best C. is made by well mixing hydraulic mortar (see CEMENT) with sand and sufficient water for complete hydration, and then adding the shingle or screened ballast, and mixing them well together. An inferior C. may be made by laying the shingle into the foundation or other place where the C. is required, and then pouring mortar upon it, to fill the interstices between the pebbles.

The principal use of C. is to form a basis of artificial stone for buildings that rest upon loose or damp subsoils. Such a basis, if well made, forms a solid foundation-slab upon which the weight of the whole structure is equally distributed. It also resists the capillary ascent of moisture from the soil, which would otherwise take place through brick-work or porous stone. A very extensive and important application of C. in this manner has been made in the lower part of Pimlico and Thames Bank. An extensive district that, only a few years since, was a pestiferous marsh, is now covered with high-class houses, and forms one of the fashionable quarters of the West End of London. The houses, and, in fact, the streets altogether, may be said to rest upon a substratum of artificial rock formed of C., which, besides giving stability to the buildings, shuts out the exhalations from the soil, and prevents the ascent of the moisture so abundant below.

C. is occasionally used for building walls by ramming it into moulds, giving it the form desired. A very beautiful application of C. for making mosaic floors is common in Italy. A stratum of cement is laid, and the surface carefully levelled; then pebbles of variegated colours are sifted over it; before it is quite hardened, these are beaten down, so as to be imbedded in the cement, and form the top layer. When the C. has completely hardened, the rounded surfaces of the pebbles are ground down by means of a large slab of stone, which, together with sharp sand, is rubbed over the surface until it is quite smooth; and thus a variegated pavement is formed by the flattened surfaces of the coloured pebbles and the cement between them.

**CONCRE'TION**, in Medicine, a formation of solid unorganised masses within the body, either by chemical precipitation from the fluids, or by the accidental aggregation of solids introduced into the system from without. In the former case, a C. is termed a Calculus (q. v.); in the latter, the C. may be either wholly composed of solids foreign to the body, or these may be mingled with the elements of the secretions, as with mucus, or calculous matter. Thus beans, peas, needles, &c., introduced into the cavities of the body, have become the nuclei of concretions, by attracting around them mucus, or crystalline deposits from the urine. The most remarkable forms of C., however, are perhaps those formed in the stomach and intestines of man and the lower animals, from the more solid and indigestible parts of the food, or of substances improperly swallowed. Thus, young women have been known to acquire the habit of swallowing their own hair to a great extent; and very large concretions have been thus formed, which have proved fatal, by obstructing the passage of food. The annexed cut (fig. 1) shews such a C., retaining exactly the form of the stomach within which it was found. The

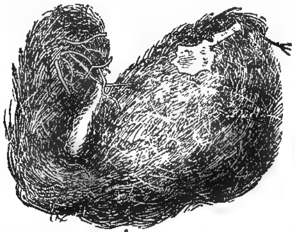


Fig. 1.—Mass of hair and string from the stomach of a young girl.
Taken from the *Pathological Society's Report.*

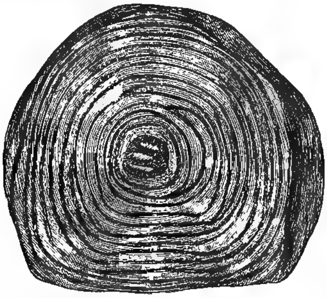


Fig. 2.—Section of an alvine or intestinal concretion, formed in successive layers upon a piece of bone.
Taken from Munro's *Anatomy.*

use of oatmeal in large amount has also been found to lead to concretions, especially when eaten coarsely ground and unboiled; such concretions have commonly been found in the intestines (see fig. 2). The excessive domestic use of magnesia in the solid form as a laxative, has been known to have a similar effect. In certain animals, intestinal concretions are not uncommon, and grow to an immense size; they used to be greatly prized as antidotes, and were used in medicine under the name of Bezoars (q. v.). In certain forms of morbid deposits, such as fibrous tumours (see TUMOUR), and in Tubercle (q. v.), concretions not unfrequently form; they are for the most part composed of phosphate of lime.

**CONCRE'TIONARY STRU'CTURE** is a condition in rocks produced by molecular aggregation subsequent to the deposition of the strata, whereby the material of the rock is formed into spherules or balls, as in the grains of oolitic limestone, or the larger concretions of magnesian limestone.

**CONCU'BINAGE.** The earliest Roman laws were distinguished for the strictness with which they treated marriage. They not only upheld thoroughly the principle of monogamy, but they fettered marriage itself with many burdensome forms. Hence arose the practice of a free unmarried man entering into a less strict relation with a single woman—a sort of permanent cohabitation. The offspring of such a connection, called natural children, had not the rights of legitimate children, but they were recognised by the father. Augustus, with a view to promote regular marriages, and check the growing licentiousness, enacted a comprehensive marriage-law (*Lex Julia et Papia Poppœa*), which still allowed C., but only with women of low rank or who had lost their station. Christianity required the complete sanctity of marriage, although the civil law long continued to tolerate separation at pleasure. In the Eastern empire, C. was entirely prohibited by the Emperor Leo. The ancient laws of the Germans recognised, along with regular marriage, an informal connection of the sexes. In the middle ages, a similar connection became customary, called a 'left-handed,' or Morganatic Marriage (q. v.). The Code Napoleon does not allow of C., but the wife can sue for separation only when the husband maintains a mistress in the common dwelling.

**CONCU'RRENT JURISDI'CTION.** Jurisdiction is said to be concurrent, or cumulative, when it may be exercised in the same cause by any one of two or more courts. To prevent the collision which might arise from each of the courts claiming to exercise the right, it has been established as a rule, that the judge who first exercises jurisdiction in the cause acquires a right, *jure prœventionis*, to judge in it exclusive of the others. The judge by whose authority an offender is first cited or first apprehended, prevents, and so excludes the other from his right of cognizance. 'This right of prevention plainly appears to be peculiar to criminal jurisdiction. In civil, it is the private pursuer who has the only right of choosing before which of the courts he shall sue.'—Erskine's *Institutes*, b. i. tit. ii. s. 9. Opposed to *concurrent* or *cumulative*, is *privative* jurisdiction. In England, in some cases, there is C. J. between the superior and county courts. 'Where the plaintiff dwells more than 20 miles from the defendant; or where the cause of action did not arise wholly, or in some material point, within the jurisdiction of the court, within which the defendant dwells or carries on his business at the time of the action being commenced; or in general where any officer of the county court is a party; in any of these cases, the superior courts have a concurrent jurisdiction.'—Stephen's *Com.*, v. iii. p. 383. By 19 and 20 Vict. c. 108, s. 39, it is provided, that if, in an action or contract, the plaintiff claims more than £20, or, in an action of *tort* (that is, for wrong independent of contract), more than £5, and the defendant gives notice that he objects to the action being tried in the county courts, and gives security for the amount sued for with costs—all proceedings shall be stayed in the county court.—*Ib.* note.

**CONCU'SSION,** in Medicine, a sudden impression or shock communicated to the brain or to the whole nervous system, as the result of a severe injury, or collision of the body with some external object, as in a fall, or in the crash of a railway accident. It is usual to distinguish C. from the more mechanical results of injury, by observing its effect upon the circulation and on the general sensibility; and there can be no doubt that the distinction is well founded, for in the first place death may follow from C. alone, without any appreciable destruction of texture; and 2dly, C. may be followed by recovery within a few hours, leaving the local injury entirely unattended by constitutional disturbance; or recovery may be complete, there having been no local injury at all. Under the immediate shock of injury, the patient is usually unconscious and insensible, pale, cold, sometimes shivering, pulseless, or nearly so, the pupils inclining to contraction rather than dilatation, or in some cases natural; the breathing is irregular, slow, feeble, and sighing; the secretions are suspended; the stomach often yields up its contents; and the bowels and bladder may also be evacuated. This state ends either in death, or in gradual re-action, which may pass over into a state of inflammatory fever, with violently excited circulation, and greatly increased heat of the surface. In the treatment of C., it is sometimes necessary to have recourse to stimulants; but in general, moderate heat applied to the surface, abundant supplies of fresh air, and careful adjustment of the injured parts, are all that is necessary till consciousness is somewhat restored, and the power of swallowing regained; some warm soup should then be given, with a small allowance of wine or other stimulant, proportioned to the age and habits of the individual; and the effect being carefully watched, this treatment may be continued until restoration is complete. If there be danger of failure of the breathing or heart's action, artificial respiration (see RESPIRATION) should be employed without delay; and the patient should be transferred as soon as possible from the place of the accident to a warm and comfortable bed, where the necessary restoratives may be more conveniently used. The connection of the nervous system with the heart, in cases of C., is a very curious subject in physiology, and has been the subject of minute investigations by Bichat, Legallois, Wilson Philip, Marshall Hall, and many others.

**CONCUSSION FUSE.** See FUSE.

**CONCUSSION SHELL.** See SHELL.

**CONDÉ,** the name of several places in France, the following being the most important:

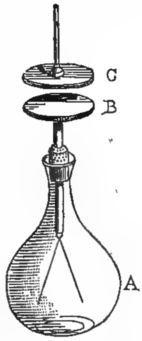
CONDÉ, in the department of Nord, situated at the confluence of the Haine and Scheldt, about seven miles north-north-east of Valenciennes. It has an arsenal and strong fortifications, constructed by Vauban. Its importance made it the scene of several severe contests during the Napoleonic wars. It has manufactures of starch, chicory, leather, and cordage. Pop. 3183.—CONDÉ-SUR-NOIREAU, a town in the department of Calvados, at the union of the Durance and the Noireau, 25 miles south-south-west of Caen. It is an old place, with dark heavy houses. Its manufactures are cottons, cutlery, and leather; and it has a pretty extensive trade in cattle, honey, &c. Pop. 6279.

**CONDÉ**, a family celebrated in French history, and which takes its name from the town of Condé (q. v.), in the department of Nord. One Godfrey de C., about the year 1200, was in possession of a part of the barony of Condé. His great-granddaughter, Jeanne of C., married in 1335 Jacques de Bourbon, Comte de la Marche, and the barony of C. went to their second son, Louis de Bourbon, Comte de Vendôme, whose great-grandson, Louis de Bourbon, Prince of C., in virtue of his blood-relationship to the royal family, assumed the title of Prince, and is regarded as the founder of the new house of this name.

**CONDÉ, Louis de Bourbon, Prince de**, was born 7th May 1530, and first distinguished himself under Marshal Brissac. In the dissensions between the Houses of Guise and Bourbon, C. was the soul of his party, which was for the most part Calvinistic or Huguenot. It was he who directed the conspiracy of Amboise, which had for its aim the banishment of the Guises, and the capture of Francis II. On its discovery, he fled to his brother at Nérac, and there projected a plan for securing possession of all the large towns of France, which, however, miscarried, and C. himself was taken prisoner, and condemned to be executed; from which fate he was luckily saved by the opportune death of the king. On the accession of Charles IX. to the throne, C. obtained his liberty and the governorship of Picardy; but the harsh treatment which the Huguenots in general received, drove him into rebellion; and on the 11th of April 1562, he commenced a civil war by the capture of Orleans, Rouen, and other places. Defeated and taken prisoner at the battle of Dreux, in the same year, he was employed by the victors in concluding a treaty of peace, which lasted only a short time. C. recommenced hostilities by a daring but unsuccessful attempt to possess himself of the person of his sovereign (28th September 1567). After the battle of St Denis, 10th November 1567, a second peace was concluded; but having reason to believe that Catharine de' Medici was plotting against his liberty, he once more renewed the war against the Catholic party, in the beginning of 1569, but was again defeated and taken prisoner at the battle of Jarnac, 13th March of the same year. While his wounds were being dressed on the field, a captain of the Swiss guard, named Montesquieu, approached, and shot him through the head. C. was of a joyous and amorous disposition. His gallantries were far from being in accordance with the austere character of the religion he professed, and it cannot be doubted that the feeling of political rivalry to the House of Lorraine, which animated the Bourbon family, explains the career of C. quite as much as his religious convictions.

**CONDÉ, Louis II. of Bourbon, Prince of**, commonly termed 'the Great Condé,' was the great-grandson of the preceding, and was born September 8, 1621. In youth (1640—1642), he took part in the sieges of Arras and Perpignan, and commanded the army against the Spaniards in the Netherlands, where he almost extirpated the foe in the battle of Rocroi, May 19, 1643. In the autumn of the same year, he was sent to Alsace to support Turenne; and in the engagements of August 3 and 5, 1644, he defeated the Bavarian general Mercy near Freiburg, and so won for France a considerable portion of Germany. By the death of his father, 1646, C. became the head of his family, and, next to the Duke of Orleans, was the highest personage in the state. This pre-eminence excited the envy of Cardinal Mazarin, who, however, in 1648, intrusted C. with the command of the army in the Netherlands. Here the prince captured Ypres, and gained the battle at Lens, but was called back to Paris by the war of the Fronde (q. v.), which had just broken out. In this contest, C. at first sided with the court, while his brother, Prince of Conti, and his sister, the celebrated Duchess of Longueville, took the part of the *Frondeurs.* After the court had secretly escaped from Paris (January 6, 1649), C. concluded a treaty which insured the return of the court to Paris in August of the same year. But as this service met with no adequate thanks, C., who was the haughtiest Frenchman of his age, soon became more violently rebellious than the Frondeurs themselves, at least in his language and deportment. Cardinal Mazarin consequently arrested C., with his brother and the Duke of Longueville; but was soon compelled to release him, on account of the threatened operations of Turenne and the Fronde. Though C. now enjoyed the favour of the people, his relations with the court were unfriendly even after Mazarin had been banished, and when Louis XIV. assumed the government, 1651. He therefore renewed the war, with, as some suppose, the ambitious view of obtaining the supreme power. At the head of troops collected in the Netherlands, he gained the battle of Bleneau, in April 1652, and immediately marched upon Paris, while Turenne, who had remained steady in his loyalty, advanced to defend the court. A bloody but indecisive struggle took place in the streets of Paris. Many of C.'s ablest adherents, however, were killed, and the Frondeurs began to give in. A treaty was drawn up, to which most of them agreed, but the proud impracticable C. would have nothing to do with it; furious at the defection of so many of his friends, he went into Champagne to gather troops, and after a fruitless effort to seize Paris, he left the country, and, on the formal outbreak of war between France and Spain, became generalissimo of the Spanish forces, but was unable to gain the advantage over Turenne. When the peace of the Pyrenees was concluded between France and Spain, it was thought advisable to enter into friendly relations with the brilliant traitor. C. was therefore pardoned, and reinstated in his former honours. The war having been renewed by Spain, 1673, he again commanded the French in the Netherlands. After Turenne's decease, he held the command in Germany, but was ultimately so disabled by gout, that he had to resign his post. He now retired to his estate of Chantilly, where he devoted his remaining years to literature (for which, in his early years, he had exhibited a strong predilection), the society of friends, and religious exercises. He died at Fontainbleau, December 11, 1686. The Prince of C. had a superior intellect and great strength of character, associated with pride. Though an able commander, he was disliked by the soldiers, on account of his severity.—Mahon, *Life of the Great Condé* (1840).

**CONDE'NSER**, the apparatus used in conjunction with an electrometer to increase its sensibility, and render it available for indicating the presence of very feeble electricity. A C. of the simplest form is shewn in the accompanying figure. A is a gold-leaf electrometer. The condensing apparatus consists of the two brass plates, B and C, which are placed horizontally, the lower one being connected with the metal rod to which the gold leaves are attached,



Condenser.

and the upper one being provided with an insulating glass handle. These plates are accurately ground, the one to the other, so that when placed upon each other, they touch in every part. Their inner surfaces are covered with a very thin and equable layer of shell-lac. When an observation is made, the excited body is brought into contact with the lower plate, and the finger of the observer is laid upon the upper. This being done for a sufficient time, the finger is first removed, and then the excited body, after which the plate C is lifted by its handle parallel to the other plate, the gold leaves at the same time diverging under the influence of the electricity left in the lower plate. The same observation might have been made with the positions of the finger and the excited body reversed, but the leaves would then be charged with the opposite electricity to that of the excited body. Reverting to the first case, the electricity to be tested is communicated to the lower platé in small successive charges, which, acting through the thin layer of shell-lac, induce, as in the Leyden jar, a corresponding charge of the opposite electricity on the lower surface of the upper plate, and send the similar electricity of the upper plate through the finger into the ground. Each weak charge of electricity given to the lower plate is not allowed to dissipate, but is kept fixed or bound by the corresponding charge of the opposite electricity which it has induced on the upper plate, so that an accumulation of such charges takes place. As yet, however, there is no excitement visible in the gold leaves, the electricity so condensed in the plate B being capable of acting only in one direction—viz., towards the charge of the upper plate. When, however, the plate C is removed, the collected electricity of the lower plate being no longer restrained to act towards it, immediately extends to the leaves below, and causes a marked divergence. In this manner, electricity of too low a tension to affect immediately the gold leaves can be condensed, so as to possess the power of doing so.

It is found that the efficiency of the C. depends upon the accurate grinding of the plates, the thinness and evenness of the layer of shell-lac with which their inner surfaces are varnished, the size of the plates, and their parallelism on removal. This last is of the utmost importance; and it is found, where numerical results are wanted, that little dependence can be placed on the parallelism attained by the hand. For more accurate observations, the C. is made quite separate from the electrometer. The plates are in this case attached vertically to two wooden pillars, on which they are insulated, and which slide in a horizontal groove made in the sole of the instrument. The plates, thus guided by the grooves, are made to approach and to retire from each other with their faces parallel. In a C. of this description, no shell-lac varnish is used, the air between the plates acting as the dielectric in its place. When one of the plates is connected with the knob of the electrometer, the observation proceeds as already detailed.

**CONDENSING STEAM-ENGINE.** See STEAM-ENGINE.

**CONDESCE'NDENCE.** In the judicial procedure of Scotland, a C. is an articulate statement of the facts, accompanied with a note of the grounds in law on which the pursuer of an action rests. Formerly, the C. was a separate pleading from the Summons, or judicial writ by which the defender is called into court. By the passing of 13 and 14 Vict. c. 36 (31st October 1850), commonly known as Lord Rutherfurd's Act, the forms in Scotland were very much simplified. The summons, in place of containing a rambling statement of the grounds of action, which was afterwards to be rendered articulate and explicit by the C., is now a merely formal writ, setting forth the name and designation of the pursuer and defender, and the conclusions of the action. To the summons, however, is appended a C. setting forth the grounds of action in articulate statements, and to this again is subjoined a note of pleas in law, so that the whole case of the pursuer is contained in the very first pleading in the cause. The papers on both sides may be revised if necessary; and the record, as the written pleadings and productions are called, is then adjusted by the judge. The cause is now ready for Debate (q. v.).

**CONDESCENDENCE AND CLAIM.** See MULTIPLEPOINDING.

**CONDILLAC,** ETIENNE BONNOT DE MABLY DE, a French philosopher of the 18th c., was born at Grenoble, 1715. In early youth, his delicate health delayed his progress in education. In 1746, he published his *Essai sur l'Origine des Connaissances Humaines*, a work which derives all thought and knowledge from the exercise of the senses. It was intended to carry out the principles of Locke, which were misunderstood and misrepresented by C. as entirely based on sensationalism. To refute various metaphysical theories, C. wrote a *Traité des Systèmes* (1749). In 1754, appeared his *Traité des Sensations*—a work supplying the details of the sensational theory. C. supposes a statue organised within like a man, but its body—so to speak—being composed of marble, hinders it from possessing any sensibility. C. further supposes himself to have the power of endowing the statue with one sense after another, until it becomes perfectly a human being, and so endeavours to shew that as it would then possess exactly the same kind of ideas as ourselves—and yet while destitute of sensations, possessed none—it logically follows that ideas spring exclusively from sensations. In all his writings, C. displayed acuteness in analysis, and as consistently as was possible, adhered to the extreme theory of sensationalism. C. passed his life mostly in quiet retirement, and died at his estate near Beaugenci, August 3, 1780.

**CO'NDIMENTS,** or seasoning agents, are those substances which are employed at table for the purpose of imparting a flavour or seasoning to the ordinary solid or liquid food. The greater part of C. are necessary to sustain the proper functions of the alimentary system, and besides gratifying the appetite, minister, more or less, to the wants of the structure. The principal C. are saline substances, such as common salt; acidulous bodies, such as acetic acid or vinegar; oily C., such as butter and olive-oil; saccharine substances, such as sugar and honey; and aromatic and pungent C., such as mustard, ginger, pepper, and pickles. The members of the last class owe their characteristic properties to the presence of a volatile oil or resin.

**CONDI'TION,** in Logic, denotes that which must precede the operation of a cause. It is not regarded as that which produces an effect, but as that which renders the production of one possible. For instance, when an impression is made on wax by a seal, the seal is said to be the cause; the softness or fluidity of the wax, a condition. Some logicians, however, are of opinion, that the distinction usually made between C. and cause is arbitrary.

**CONDITION.** See TRAINING.

**CONDITION,** in Law. This word is of peculiar importance in the real property law of England, as forming the foundation upon which the right of alienation of land, as well as the system of entails and that of mortgages was raised. Originally, a gift of an estate to a tenant (or vassal) by the lord of the fee did not convey more than a life-estate; and when a gift was made to a man and the heirs of his body, it was held that it was a gift upon C. that he had heirs of his body. But if the C. was performed by his having children, although they might all die before his own death, the judges held that his estate became absolute, to the effect that he might aliene the land, and so bar not merely the succession of his issue, but the right of the lord in default of issue, although, if he did not aliene, the lord would recover in the event of the tenant's death without issue. But it came afterwards to be held that a gift to a man and the heirs of his body conferred what is called an estate tail, which might at once, by certain forms, be converted into an absolute estate, independent of the birth of issue. See ESTATE TAIL.

A mortgage is an estate given to the mortgagee upon C. that he restores it upon payment of a fixed sum borrowed by the mortgager. This is an example of an estate upon C. *expressed*. An estate attached to an office is an estate in the holder of the office upon C. *implied*, that he shall perform its duties. A C. may also be either *precedent* or *subsequent*. In the former case, the gift does not take effect until the C. is performed; in the latter, it becomes void when the C. occurs. The right to take advantage of a C. subsequent cannot be bestowed on a stranger, but can only be reserved to the grantor and his heirs, though after such reservation it may be assigned to a stranger. Conditions which are incapable of performance, or contrary to law, are void; and if such a C. is precedent, it makes the gift void; if subsequent, the estate becomes absolute in the tenant. But if a C. become illegal, or impossible, subsequently to the making of the grant, it has a different effect, according as the effect is produced by statute or by other circumstances. If by statute, the party bound to perform the C. is relieved from it; if by other circumstances, he loses his right, as being unable to perform the condition.

In contracts, conditions which are *mala in se* render the contract void; but it is otherwise if the C. is merely opposed to an arbitrary rule of law, in which case the C. only is void, and the contract subsists. In legacies, a similar rule prevails. But in the case of legacies, a C. impossible of performance is generally taken *pro non scripto*—whereas in contracts, it commonly annuls the claim of the party who has bound himself to its performance.

**CONDITIONED, THE PHILOSOPHY OF THE.** This phrase has been brought into use by Sir W. Hamilton, to express the inability of the human mind to conceive or reason respecting the Absolute and the Infinite. Our thought, according to him, can only be of the *relative* and the *finite*, of which these terms are but the negations; relativity and finitude are the conditions under which the human intelligence operates. In a dissertation on this subject (*Discussions in Philosophy*, p. 1), he criticises, and endeavours to refute the opposite position as maintained by Cousin—a modification of the previous doctrine of Schelling—that 'the Unconditioned, the Absolute, the Infinite, is immediately known in consciousness, and this by difference, plurality, and relation.'

As this doctrine of Sir W. Hamilton has been raised into an especial importance by Mr Mansel in his *Bampton Lectures*, some account of the reasonings adduced in its favour may here be given. We shall first quote the author's own statement:

'In our opinion, the mind can conceive, and consequently can know, only the *limited, and the conditionally limited.* The unconditionally unlimited, or the *Infinite*, the unconditionally limited, or the *Absolute*, cannot positively be construed to the mind; they can be conceived only by thinking away from, or abstraction of, those very conditions under which thought itself is realised; consequently, the notion of the Unconditioned is only *negative*—negative of the conceivable itself. For example: On the one hand, we can positively conceive neither an absolute whole, that is, a whole so great that we cannot also conceive it as a relative part of a still greater whole; nor an absolute part, that is, a part so small that we cannot also conceive it as a relative whole, divisible into smaller parts. On the other hand, we cannot positively represent, or realise, or construe to the mind (as here Understanding and Imagination coincide) an infinite whole, for this could only be done by the infinite synthesis (union) in thought of finite wholes, which would of itself require an infinite time for its accomplishment; nor, for the same reason, can we follow out in thought an infinite divisibility of parts. The result is the same, whether we apply the process to limitation in *space*, in *time*, or in degree. The unconditional negation, and the unconditional affirmation of limitation; in other words, the *Infinite* and the *Absolute, properly so called*, are thus equally inconceivable to us.'—*Discussions*, p. 13, 2d edition.

The fundamental ideas involved in this view are certain observed facts with reference to the human mind, or the human consciousness; which facts, although very much overlooked in former times, are now beginning to be pretty generally recognised. It is a general law of our mental constitution, that change of impression is essential to consciousness in every form. The remark was made by Hobbes, that it is 'almost all one for a man to be always sensible of one and the same thing, and not to be sensible at all of anything.' There are notable examples to shew that an unvarying action on the senses fails to give any perception whatever. Take the pressure of the air on the surface of the body. Here we have an exceedingly powerful effect upon one of the special senses. The skin is under an influence exactly of that nature that wakens the feeling of touch, but no feeling comes. Withdraw any portion of the pressure, as with a cupping-glass, and sensibility is developed. A constant impression is thus, to the mind, the same as a blank. Our partial unconsciousness of our clothing is connected with the constancy of the object. Remission or change is, therefore, absolutely requisite in order to sensibility.

The necessity of change in order to produce feeling or consciousness of any sort, must apply to the special kind of consciousness that we call knowledge. To know light, is to pass from its presence to its absence, or the opposite; everlasting, unvarying luminosity, in an eye always awake, would not be known to the human mind. It is transition that develops knowledge, whence flows the important consequence, that knowledge *never can be of one property alone;* there must always be at least two properties in every act of knowing. We may say that we know light; but in so doing we also know darkness, and we could not know either by itself. When we touch clay and marble, we know hard and soft; but if we had never touched a soft body, we should have no conception of a hard one. Living in one constant temperature, like the fish in the tropical seas, we should know neither heat nor cold; passing from a high temperature to a low, or from a low to a high, we know both; and such is the alternative presented in every case to the human understanding. This great fundamental law of the human mind is now commonly designated by the phrase, *the relativity of knowledge or of cognition.*

Mr Mansel, accordingly, disputes the possibility of our conceiving the infinite, by shewing that such a conception passes the limits of human consciousness. The following extract will shew his mode of reasoning: 'Now, in the first place, the very conception of consciousness, in whatever mode it may be manifested, necessarily implies *distinction between one object and another*. To be conscious, we must be conscious of something; and that something can only be known as that which it is, by being distinguished from that which it is not. But distinction is necessarily limitation; for, if one object is to be distinguished from another, it must possess some form of existence which the other has not, or it must possess some form which the other has. But it is obvious that the infinite cannot be distinguished, as such, from the finite, by the absence of any quality which the finite possesses; for such absence would be a limitation. Nor yet can it be distinguished by the presence of an attribute which the finite has not; for, as no finite part can be a constituent of an infinite whole, this differential characteristic must itself be infinite, and must at the same time have nothing in common with the finite. We are thus thrown back upon our former impossibility.'—Lecture 3d.

'A second characteristic of consciousness,' according to Mr Mansel, 'is, that it is only possible in the form of a *relation*. There must be a Subject, or person conscious, and an Object, or thing of which he is conscious. There can be no consciousness without the union of these two factors; and, in that union, each exists only as it is related to the other. The subject is a subject, only in so far as it is conscious of an object; the object is an object, only in so far as it is apprehended by a subject; and the destruction of either is the destruction of consciousness itself. It is thus manifest that a consciousness of the absolute is equally self-contradictory with that of the infinite. To be conscious of the absolute as such, we must know that an object which is given in relation to our consciousness, is identical with one which exists in its own nature, out of all relation to consciousness. But to know this identity, we must be able to compare the two together; and such a comparison is itself a contradiction. We are, in fact, required to compare that of which we are conscious, with that of which we are not conscious, the comparison itself being an act of consciousness, and only possible through the consciousness of both objects.'

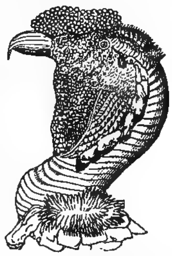
The author then lays down a third condition of consciousness—namely, relation to *time*. Everything conceived by us is conceived as under the two manifestations of *succession* and *duration*, from which he endeavours to shew 'that an act of *creation*, in the highest sense of the term—that is to say, an absolutely first link in the chain of phenomena, preceded by no temporal antecedent—is to human thought inconceivable. To represent in thought the first act of the first cause of all things, I must conceive myself as placed in imagination at the point at which temporal succession commences, and as thus conscious of the relation between a phenomenon in time and a phenomenon out of time. But the consciousness of such a relation implies a consciousness of both the related members; to realise which, the mind must be in and out of time at the same moment.

And, further: 'Subordinate to the general law of time, to which all consciousness is subject, there are two inferior conditions, to which the two great divisions of consciousness are severally subject. Our knowledge of body is governed by the condition of *space*, our knowledge of mind by that of *personality*. I can conceive no qualities of body save as having a definite local position; and I can conceive no qualities of mind save as modes of a conscious self.'—Lecture 3d.

By the application of those four conditions or limitations of the human consciousness—distinction, relation, succession, and duration in time, and personality as regards the conception of mind—it is Mr Mansel's purpose to demolish the foundations of the metaphysical theology of former ages, which was largely conversant with proofs *à priori* of the infinity and the absolute existence of a Deity. According to him, a rational theology is impossible to be attained. 'Our whole consciousness manifests itself as subject to certain limits, which we are unable, in any act of thought, to transgress. That which falls within these limits, as an object of thought, is known to us as *relative* and *finite*. The *absolute* and the *infinite* are thus, like the *inconceivable* and the *imperceptible*, names indicating, not an object of thought or of consciousness at all, but the mere absence of the conditions under which consciousness is possible. The attempt to construct in thought an object answering to such names, necessarily results in contradiction—a contradiction, however, which we have ourselves produced by the attempt to think—which exists in the act of thought, but not beyond it—which destroys the conception as such, but indicates nothing concerning the existence or non-existence of that which we try to conceive. It proves our own impotence, and it proves nothing more.'

**CONDONA'TION**, in the legal phraseology both of England and Scotland, means forgiveness, or *remissio injuriarum*, when urged as a defence against an action of divorce on the ground of adultery.

**CO'NDOR** (*Sarcoramphus gryphus*), the great vulture of the Andes, and the largest of known birds. Its dimensions, however, were for a long time greatly exaggerated. It is not always much larger than the *lämmergeyer* of the Alps, being sometimes not scarcely more than four feet long, and its expanse of wings about nine feet, although these dimensions are often considerably exceeded, and the expanse of wings reaches fully fourteen feet. The wings are long, and extremely powerful; the tail short, and wedge-shaped; the general colour black, which is brightest in old males, the young being of a brownish colour, which has given rise to a notion that there are two species; the males are also distinguished by having great part of the wings white. Around the lower part of the neck of both sexes there is a broad white ruff of downy feathers, above which the skin is bare, and exhibits many folds. The head of the male is crowned with a large cartilaginous comb, and the neck is furnished with a dilatable wattle. The beak is thick and strong, straight at the base, but the upper mandible strongly curved at the extremity. The C. feeds mostly on carrion. Its voracity is enormous. Tschudi mentions one in confinement at Valparaiso which ate 18 lbs. of meat in a single day, and seemed next day to have as good an appetite as usual. Condors often gorge themselves so that they cannot fly, and if attacked, must disgorge in order to escape. They inhabit regions 10,000 or 15,000 feet above the level of the sea, where they breed, making no nest, but laying their eggs on the bare rocks, and where they are usually seen in small groups. To these haunts they return, after



Head of Condor.

their descents into the plains for food. The height to which the C. soars in the air exceeds that of any other bird, and is said to be almost six perpendicular miles above the level of the sea, or nearly six times the ordinary height of the clouds.—To the same genus with the C., distinguished by the cartilaginous comb, bare neck, and peculiar shape of bill, belong the King Vulture, or King of the Vultures (*S. papa*), of the warm parts of America, and the Californian Vulture (*S. Californianus*). The king of the vultures is about the size of a goose, and derives its name from its driving away other vultures from prey at its pleasure. Its plumage is finely coloured, reddish above, white beneath, with bluish-gray ruff, and black quills and tail.—The birds of this genus have no voice, and make only a sort of weak snorting.

Condor.

**CONDORCET**, Jean Antoine Nicolas de Caritat, Marquis de, an eminent French author, was born September 17, 1743, at Ribemont, near St Quentin, in the department of Aisne; studied at the college of Navarre; and by his *Essai sur le Calcul Intégral* (afterwards given in an extended form in his *Essais d'Analyse*), gained for himself, at an early age, a seat in the Academy of Sciences. With ease and remarkable ingenuity, C. treated the most difficult problems of mathematics; but though deserving high praise, his powers lay rather in suggestion than in rigorous demonstration. After the appearance of his *Eloges des Académiciens Morts avant* 1699 (Paris, 1773), he was made secretary of the Academy, 1777. His theory of comets gained, in the same year, a prize in the Berlin Academy. In concert with Turgot, he was induced to subject the system of the economists to a close examination, and was led by D'Alembert to take an active part in the *Encyclopédie.* In all his works—as, for example, in the *Eloges et Pensées de Pascal*—we find noble views of human destiny, and evidences of a truly benevolent disposition. At the Revolution, he was elected member for Paris in the Legislative Assembly, of which he was president in 1792. In the National Convention, as deputy for the department of Aisne, he mostly voted with the Girondists, and shared in the downfall of that party. Accused, in October 1793, he concealed himself, and consequently was outlawed. A generous lady, Madame Verney, had the courage to provide for him a hiding-place, where he remained for some months, and in very miserable circumstances wrote his most remarkable work, the *Esquisse des Progrès de l'Esprit Humain.* Having afterwards quitted his concealment, he was arrested at Clamart, sent to Bourg-la-Reine, and cast into prison. The next morning, March 28, 1794, he was found lying dead on the floor. He had, it is believed, poisoned himself. His collected works (exclusive of his mathematical essays) were edited by Garat and Cabanis (21 vols., Paris, 1804).—His wife, Sophie de C. (sister of Marshal Grouchy), born 1765, assisted in the literary labours of C., and also translated into French Adam Smith's *Theory of Moral Sentiments.* She died September 6, 1822.

**CONDOTTIE'RI**, the name given in the 14th c. to the leaders of certain bands of military adventurers who, for booty, offered their services to any party in any contest, and often practised warfare on their own account purely for the sake of plunder. These mercenaries were called into action by the endless feuds of the Italian states during the middle ages. Among the most celebrated of their leaders were Guarnieri, Lando, Francis of Carmagnola (about 1412), and Francis Sforza (about 1450). The last-mentioned made himself Duke of Milan. The *Compagnies Grandes* in France, during the 14th c., resembled the bands led by the Italian condottieri. They originated in the long bloody wars between France and England. The mischief done by them became so intolerable, that in several parts of the country the peasantry armed themselves, and under the name of *pacifères*, formed associations against the plunderers. Nevertheless, these French C. were so powerful that, in 1361, they routed the king's forces which had been sent against them, at Brignais, near Lyon, and slew the Constable of France, Jacques de Bourbon; but the Constable du Guesclin having persuaded them to seek their fortune in the Spanish service, they at length disappeared from the country.

**CONDU'CTOR**, in Music, is the person placed at the head of a band of musicians to lead the performance and beat the time. In Germany, the term Dirigent is used, which is more expressive.

**CONDUCTORS**, in the Royal Artillery, are those artillerymen who have charge of the ammunition-wagons in the field; they are, to some extent, under the control of the commissariat officers, who have to provide means of transport; but since the recent changes in the commissariat department, they have been more exclusively under the control of their own proper artillery officers.

**CONDUCTORS AND NON-CONDUCTORS OF ELECTRICITY.** If a rod of metal be made to touch the prime conductor of an electrical machine immediately after the plate has ceased to rotate, every trace of electricity immediately disappears. But if the rod were of shell-lac, little or no diminution would be perceptible in the electrical excitement of the conductor. The metal in this case leads away the electricity into the body of the experimenter, and thence into the ground, where it becomes lost, and it receives in consequence the name of a conductor. The shell-lac, for the opposite reason, is called a non-conductor. Different substances are found to possess the power of conducting electricity in very different degrees. The following series classifies the more common substances according to their conducting powers, beginning with the best, and ending with the worst conductors. Conductors—The metals, graphite, sea-water, spring-water, rain-water. Semi-conductors—Alcohol and ether, dry wood, marble, paper, straw, ice at 32° F. Non-conductors—Dry metallic oxides, fatty oils, ice at −13° F., phosphorus, lime, chalk, caoutchouc, camphor, porcelain, leather, dry paper, feathers, hair, wool, silk, gems, glass, agate, wax, sulphur, resin, amber, shell-lac.

The arrangement into conductors, semi-conductors, and non-conductors, is made with reference to frictional electricity, or electricity of a high tension. The substances which are semi-conductors for frictional electricity are found to be almost, if not altogether, non-conducting for the electricity of the galvanic battery, which is too feeble to force a passage through them. The metals, which appear to be all nearly alike conducting for frictional electricity, offer widely differing resistances to the transmission of the galvanic current. By experiments made with galvanic electricity, it is found that the more ordinary metals stand thus, as regards their powers of conduction, beginning as before with the best conductor: Silver, gold, copper, brass, zinc, iron, platinum, tin, nickel, lead, German-silver, mercury. An increase of temperature has in the metals the effect of lessening the conducting power, whilst in almost all other substances it has an opposite effect. Glass becomes conducting at a red heat, and so do wax, sulphur, amber, and shell-lac, when fused.

When a conductor is placed on non-conducting supports, so as to prevent the electricity communicated to it from passing into the ground, it is said to be insulated. The usual insulating material employed in the construction of electrical apparatus is glass, which, though not so perfect a non-conductor as the others lower in the scale, far exceeds them in hardness and durability. In a damp atmosphere, glass becomes coated with a thin layer of moisture, which very considerably diminishes its insulating power. Hence arises the necessity in certain states of weather of heating so as to dry all electrical apparatus previous to use. This imperfection is very much lessened by covering the glass with shell-lac varnish.

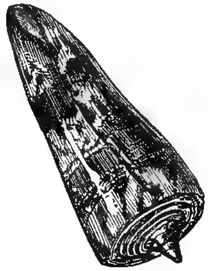
The very fact that a conductor may be insulated, indicates that the air is a non-conductor. Dry air possesses this property in a high degree, while moist air renders insulation for any length of time impossible.

**CONDYLURA.** See Star-nose.

**CONE** (*strobilus*), in Botany, a fruit-bearing spike covered with scales, each of which has two seeds at its base. Such are the fruits of the *Coniferæ* (fir-cones or fir-tops), from the usual shape of which the name C. is derived, also the fruits of the *Casuarineæ*. The name C. is applied also to the female spike, even when in flower. The scales of true cones, until they separate to allow the dispersion of the seeds, are closely compacted together; in the hop, to the fruit of which the name C. is not applied, although *strobilus* is, they are loose. Some true cones, as those of the *Araucaria*, are very far from being conical in shape. The fruit of the juniper (a *galbulus*) is a C. of which the scales have become fleshy, so as to form a false berry.

**CONE.** There are various kinds of cones, but the term is usually applied only to those having circular bases. The most common kind of circular C. is the *right* C., which may be conceived as being generated by the revolution of a right-angled triangle round one of its legs. The line from the apex of a C. to the centre of the base is called the axis, and, in the right C., it is perpendicular to the base. In the *oblique* C., the axis is inclined to the plane of the base at an angle other than a right angle. A *truncated* C. is the lower part of a C. cut by a plane parallel to the base.—Four curves, called the Conic Sections, may be formed by cutting the right C. in different directions. If the C. be cut by a plane parallel to the base, the section is a circle; if the plane cut the C. across, making any angle other than a right angle with its axis, the section is an ellipse; if the cutting plane be parallel to the side of the C., the section will be a parabola. In every other case than those stated, the section will be an hyperbola. If two cones were set one above the other, the one being just a continuation of the other through the apex, the plane producing the hyperbolic section would cut the second as well as the first, though none of the other planes would. There are thus two equal branches of the hyperbola belonging to the two cones respectively. See Circle, Parabola, &c.

**CONEGLIA'NO**, a town of Northern Italy, 28 miles north-east of Venice. It is situated on a hill-slope, crowned by an extensive castle, and has a very picturesque appearance. Half-obliterated frescoes adorn the outside of several houses in the town. C. has manufactures of woollens and silks, and a population of 6500.


Cone-shell.

**CONE-SHELL** (*Conus* and *Conidæ*), a genus and family of gasteropodous molluscs, of the order *Pectinibranchiata*, having a shell of remarkably regular conical form; the spire on the base of the cone, and sometimes rising from it to a sharp point, sometimes almost flat; the aperture narrow and straight, without protuberance or fold, extending from the base of the cone to its apex. The head of the animal has a proboscis capable of much extension; the mantle is scanty and narrow, forming an elongated siphon in front; the shell covered with an epidermis. These molluscs are carnivorous, they inhabit shores and banks of sandy mud, chiefly within the tropics, a few only occurring in the Mediterranean. The shells of many species are very beautiful, and much prized by collectors.—Cone-shells first appear in the chalk, and become more abundant in the more recent formations.

**CONFARREÄ'TION** was a peculiar mode of marriage in use among the Romans, and supposed to have been originally that practised by the patricians. Its specialty consisted in the employment of certain words in the presence of ten witnesses, and in the performance of a religious ceremony in which *panis farreus* (bread made of spelt) was used. Various priestly offices, such as that of the *Flamen Dialis*, were open only to those who were born of parents thus married.

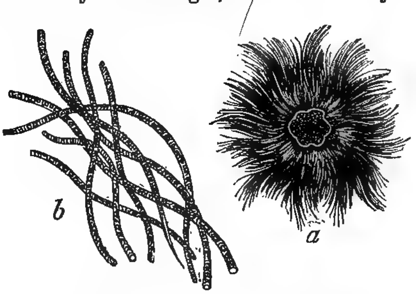
**CONFEDERA'TION**, Germanic. See Germany.

**CONFEDERATION OF THE RHINE.** During the war of 1805, so disastrous for Austria, several German princes, too weak to remain neutral, were forced to ally themselves with France. The first to do so were the Electors of Bavaria and Würtemberg, who, in recompense of their services, were elevated to the dignity of kings by the peace of Presburg, 26th December 1805. Some months after (28th May 1806), the arch-chancellor of the empire announced at the diet that he had chosen as his coadjutor and successor Cardinal Fesch, the uncle of Napoleon, a thing entirely contrary to the constitution of the Germanic empire. Finally, at Paris, on the 12th July 1806, 16 German princes formally signed an act of confederation, dissolving their connection with the Germanic empire, and allying themselves with France. These 16 princes were—the kings of Bavaria and Würtemberg, the arch-chancellor, the Elector of Baden, the new Duke of Cleves and Berg (Joachim Murat), the Landgraf of Hesse-Darmstadt, the Princes of Nassau-Usingen, Nassau-Weilburg, Hohenzollern-Hechingen, Hohenzollern-Sigmaringen, Salm-Salm, Salm-Kyrburg, the Duke of Aremberg, the Princes of Isenburg-Birstein and Leichtenstein, and the Count of Leyen. These individuals justified (or were forced to justify) their conduct by enumerating the vices of the constitution of the Germanic empire, and invited the remaining princes of Germany to imitate their example. At the same time, Bacher, the French ambassador, declared that his master no longer recognised the Germanic empire; while the territories and titles of the confederate princes (who were now under the protectorate of Napoleon) underwent considerable changes. In addition to these changes, a number of other princes and nobles of the empire were made dependent (see MEDIATISATION) on the confederation. During the years 1806—1808, several other petty German sovereigns, alarmed at the triumphs of Napoleon, hastened to enrol themselves members of this unpatriotic league; and at the close of 1808, it embraced a territory of 122,236 square miles, contained a population of 14,608,877 souls, and kept up an army of 119,180 men. The utter ruin which overtook the French army in the Russian campaign acted like a solvent on the confederation, and the year 1813 saw it vanish like mist in the sudden outburst of German patriotism, when a whole people leaped up as one man, and delivered themselves from a cruel and insulting bondage.

**CO'NFERENCE**, in English Law, signifies the interview of an attorney or solicitor with a counsel, when consulting him. Consultation properly means the meeting of barristers with each other.

**CONFERENCE**, WESLEYAN. See WESLEYAN METHODISTS.

**CONFE'RVA**, a genus of plants of the natural order *Algæ*, sub-order *Confervaceæ* (or order *Confervaceæ*). The plants of this genus consist of simple or branching jointed filaments, which are filled with green—seldom purple or red—matter, and are found in abundance in water—some of them in fresh, and some in salt water—and on moist earth. *C. rivularis*, a species common in brooks, is sometimes 2—4 yards in length, and was formerly used as an application to wounds and slight burns. This and other species are sometimes called *Crow Silk*, and are used in some places for stuffing mattresses. *C. rupestris* often covers whole rocks on the sea-coast. *C. crispa* sometimes forms a close entangled layer on inundated land, and has received the name of *Water Flannel*. *C. ægagropila*, sometimes called *Moor Ball*, is found in lakes and ponds, where it floats about freely in the water, its filaments forming an entangled ball, capable of being employed as a pen-wiper.—The name C. is not always strictly limited to the genus, but is extended to many of its near allies. Among the *Confervaceæ*—or Confervals—however, are included many plants, as the different kinds of Laver, which have a flat, and not a thread-like frond. Many also consist of cells immersed in a slimy matter. The *Confervaceæ* grow by the division, and sometimes by the branching of cells; reproduction takes place by *spores*, formed in the interior of the cells, and which at last are discharged through the walls of the mother-cell. The very interesting phenomenon of the Conjugation (q. v.) of cells has been observed in them. The spores assume the character of Zoospores (q. v.), exhibiting movements which resemble those of animals, before leaving the mother-cell, and retain this character for some time after escaping from it. *Confervaceæ* are found plentifully even in mineral waters. Their great abundance often gives a colour to the whole water of tanks, marshes, &c. The Red Sea is said to derive its name from the colour sometimes given to the surface of its waters, for distances as great as the eye can reach, by small *Confervaceæ*. The yeast-plant has been ranked among *Confervaceæ*, but is more generally regarded as one of the *Fungi*. Other vegetable organisms which appear in liquids of the most various kinds, and which have also been ranked among *Confervaceæ*, are more probably the *mycelium* of imperfectly developed *Fungi*. The plants noticed in the article ALGÆ as appearing in diseased conditions of animals, are regarded as *Confervaceæ*.—The Lavers are almost the only *Confervaceæ* ever used for human food.



Oscillatoria Distorta; a Conferval:
*a*, natural size; *b*, magnified.

**CONFE'SSION**, in its ecclesiastical sense, implies a disburdening of the conscience in the hearing of a priest (or of a layman, in urgent cases), with a view to obtain absolution. Such C. is not mentioned in the New Testament, where faith in Christ is alone prescribed as necessary to the forgiveness of sins. Cases of C. 'one to another,' among the primitive Christians appear, therefore, to have arisen rather from extraordinary circumstances or impulses than from rule or custom. Though the apostle James recommends that Christians should confess their 'faults one to another,' yet formal and open C. appears to have been first required in cases where persons guilty of gross apostasy desired to be again received into the church. Motives of piety, and a wish to avoid the scandal of open C., led gradually to the institution of private C. in the hearing of a priest. In and after the 5th c., such C. was made an indispensable preparation for receiving the Sacrament of the Lord's Supper. In the Greek Church, at the close of the 4th c., Nectarius, Bishop of Constantinople, on account of a scandal which had occurred, laid aside the practice of private C.; but in the Western Church it was retained; and as early as in the time of Leo the Great (440—461), was regarded as more or less necessary for absolution of sins. The ever-enlarging development of the doctrine that the sacrament was an 'unbloody sacrifice,' and the priest a delegate of the Supreme Being, gave occasion to a belief in the magical virtue of C., and introduced the practice of Auricular C., or C. whispered into the ear of a priest, which was established as an essential part of church discipline by Pope Innocent III., at the 4th Lateran Council, 1215. In the twenty-first canon of this council, it was determined that every Christian of mature age (*annos discretionis*) should make private C. to a priest, at least once annually, and that the clergy should confess more frequently. By a later rule, nuns were required to make monthly confessions. The Roman Catholic Church regards auricular C. as necessary in all cases of mortal sins (*peccata mortalia*) in thought, word, and deed, and as wholesome for all venial offences (*peccata venalia*). C. is styled 'general' when it includes the whole preceding life, as in the case of admission into a monastery, and in this case, any omission of a mortal sin makes the act of C. and the consequent absolution null and void. As a general rule, C. must be made orally, and in the church, and only in exceptional cases can it be made by proxy or in writing. Since the 4th c., Lent (*Quadragesima*, or the Forty Days) has been regarded as most suitable for making confession. The Greek Catholic Church, along with the Church of the Maronites and the Armenians, holds that special C., except in the cases of murder, adultery, and theft, is wholesome in cases of mortal sin, but does not consider it binding. The Russo-Greek Church regards the discipline as necessary for a due reception of the Eucharist. Among the Nestorian Christians, the practice of C. has fallen entirely into disuse. The Lutheran Church professes (according to the 11th Art. of the *Augsburg Confession*) 'that private confession must be retained in the church; but that full and particular statement of *all* sins is not necessary, because, according to Psalm xix. 12, it is impossible.' In the Apology of the Augsburg Confession, it is said to be 'impious' to abolish the practice of private C. to the priest; but in practice, the Lutheran Church has widely departed from these rules. The Reformed Church (in Germany) has always been more inclined to general C.; and the United Church also substitutes for private C. certain devotional exercises previous to communion. The Church of England employs a general form of C. and absolution in its morning and evening services, but retains private C. in the rubric for visitation of the sick. The Scotch churches do not recognise it at all.—The *Sigillum Confessionis* ('seal of confession'), both in the Roman Catholic and in the German Protestant Church, means the obligation of a confessor or priest not to divulge the secrets of the confessional. This custom of secrecy is traceable in the 4th and 5th centuries, but was made binding by Innocent III. in the 12th, and its violation by a priest makes him subject to the severest penalties that can be inflicted by the church. See CONFIDENTIALITY.

**CONFESSION**, in Law, is the admission of his guilt by an accused person. In England, proof of C. is sufficient to warrant a jury in convicting without more evidence; in Scotland, some corroborating circumstance must be proved. In both countries, however, the C., to be admissible, must have been made without any promise or threat held out to induce it. As to C. on trial, see PLEA OF GUILTY; and as to C. before the examining magistrate, see DECLARATION.

**CONFESSION AND AVOIDANCE**, in pleading at common law, in England, is the admission of the allegation of the opposite party, but with the addition of some circumstance which deprives it of legal effect, as, for instance, the admitting that an assault was committed as alleged, but with the assertion that it was committed in self-defence. See PLEADING.

**CONFESSION, JUDGMENT BY**, in England, is judgment against a defendant on his confessing both the facts and law alleged by the plaintiff. An agreement to confess judgment is a common mode of securing money, but is subject to strict technical regulations.

**CONFESSION OF FAITH.** See CREEDS and CONFESSIONS.

**CONFE'SSIONAL**, the concealed seat in which the priest sits to hear confession in a Roman Catholic church. It is probable that the confessionals in English churches, previous to the Reformation, like those still used on the continent, were slight wooden erections, because they have so entirely disappeared that their form is a matter of dispute among ecclesiologists. It would almost seem as if no such structure had been used, as there is an old painting on the walls of St Mary's Chapel, Winchester, in which a woman is represented kneeling to a priest, who is seated in his stall. Continental confessionals very much resemble sentry-boxes, having a door in front for the priest to enter by, and an opening on one or both sides, like a small window, for the penitents to speak through.

**CO'NFIDENT PERSON.** See INSOLVENCY.

**CONFIDENTIALITY**, in Law. The most common instance of C. is in the case of those communications between a client and his legal adviser, which neither of them can be called on to produce in a suit, and upon which no action of damages can be founded. The privilege extends to letters written by the lawyer to his client, relating to a suit which is either pending or contemplated; but to what extent it covers other business communications, is a question on which there are conflicting authorities in Scotland. In England, the rule has received a liberal interpretation (Dickson on *Evidence*, p. 930). The same privilege is extended to the communications of several parties, or of their counsel and agents engaged on the same side of a cause, and made with a view to their joint prosecution or defence. Where a party, placed in such circumstances, is examined as a witness, he will be entitled to decline answering questions as to such communings, and even bound to do so, unless the privilege is waived by the other party interested (Dickson, p. 924). The principle on which this privilege rests, as stated by Stephen (*Com.* iii. 466), is that these communications are made 'on such lawful occasions as tend to rebut the *primâ facie* inference of malice, which otherwise arises from a statement derogatory to private character.' It is on the same principle that a master is protected who, when called upon for the character of a servant, charges him with a theft. In such cases, in order to support an action, there must be proof of malice beyond the uttering of the words. With a view to preserving the freedom of domestic intercourse, and from a belief that the testimony of near relatives in favour of each other was worthless, and that the only effect of examining them against each other was to tempt them to commit perjury, it was formerly the habit to reject them as witnesses. The tendency in England, for a long time, however, has been to admit, and even to exact their evidence, making allowance, in appreciating its value, for the circumstances in which they are placed. The same principle has latterly been followed in Scotland; and the only exceptions which have been retained by the law of Evidence Amendment Act of 1853 (15 and 16 Vict. c. 27), to the now almost universal admissibility of witnesses, are, that neither the parties themselves, nor their husbands or wives, shall be competent or compellable to give evidence in criminal proceedings in which they are accused, nor to answer questions in a civil suit tending to criminate themselves or each other, or to reveal matters which they have communicated to each other during marriage. The C. of such communications remains although the marriage has been dissolved by death or divorce (Dickson, p. 924).

From very early times, so early, it is said, as the 4th and 5th centuries, the 'Seal of Confession' (*sigillum confessionis*) was held to be inviolable, and no priest could be called upon, under any circumstances, to reveal facts which had been confided to him under its sanction. To this the case of treason was an exception, in England, even in Roman Catholic times (Best's *Law of Evidence*, p. 737). In Roman Catholic countries, the privileges of the confessional remain unaltered; and several of the Protestant churches of Germany having sanctioned the practice of confession, the privilege of secrecy has been extended to it, as a necessary consequence, by the civil power. In these states, however, in addition to imposing far lighter penalties upon those clergymen who shall break the seal, the duty of doing so is enforced in all cases in which the confession has reference to a future crime. In England, no special privilege whatever is extended to the Roman Catholic confessional; and the question as to how far a confession made to a clergyman for the purpose of obtaining spiritual comfort and consolation is protected, seems undecided. In the last case quoted by Mr Best (p. 736, 3d ed.), the evidence tendered consisted of conversations relating to the subject of accusation between the accused and the chaplain of a workhouse; and the judge expressed so strong an opinion against it, that it was withdrawn. He added, however: 'I do not lay this down as an absolute rule; but I think such evidence ought not to be given' (R. *v.* Griffin, 6 Cox, Cr. Cas. 219). In Scotland, as in England, the point has never been directly or solemnly decided, evidence of the kind in question, when not indispensable for the ends of justice, being generally either withheld or withdrawn (Dickson, ii. p. 938). By a statute of the state of New York, United States, ministers of the Gospel and priests, of every denomination, are forbidden to disclose confessions made to them in their professional character; and a similar statute exists in Missouri. It has been decided in England, that communications to a medical man, even in the strictest professional confidence, are not protected from disclosure (Best, 734); and the same is the case in Scotland (Dickson, ii. p. 940); but a contrary rule has been adopted in several of the states of America (1 Greenl., § 248, note).

**CONFIRMA'TION**, in English Law, is where the party having right to land, grants to the party having possession that which is in him.

**CONFIRMATION**, a Latin word which signifies *strengthening*. In the ancient church, the rite so named was administered immediately after baptism, if the bishop happened to be present at the solemnity, which is still the custom in the Greek and African churches. In the Roman Catholic Church, for the last 300 or 400 years, the bishops have interposed a delay of seven years after infant baptism; in the Lutheran Church, the rite is usually delayed for from 13 to 16 years; and in the English Church, from 14 to 18 years. There is, however, in the latter church no limit to the period. C. may be administered at an earlier period, if a family is about to emigrate; and persons are confirmed up to 60 or 70, if they choose. The ceremony consists in the imposition of hands by the bishop, accompanied by an invocation of the Holy Ghost as the comforter and strengthener. But both in the Lutheran and English Churches, the ceremony is made the occasion of requiring from those who have been baptized in infancy, a renewal in their own persons of the baptismal vow made for them by their godfathers and godmothers, who are thereby released from their responsibility. None can partake of the Lord's Supper, in these churches, unless they have been confirmed. In the Roman Catholic Church, C. is held to be one of the seven sacraments, and in its administration, unction and the sign of the cross are used; and instead of the imposition of hands, the person confirmed receives a little blow on the cheek, to remind him that he must in future suffer affronts for the name of Christ. In the English Thirty-nine Articles, C. is declared not to be one of the sacraments, and the above ceremonies have been discontinued since the Reformation.

**CONFISCA'TION**, forfeiture of lands or goods to the crown, as part of the punishment for certain crimes. See Escheat.

**CO'NFLICT OF LAWS.** On the breaking up of the Roman Empire into separate kingdoms, as many systems of jurisprudence, more or less dissimilar, arose, and were administered side by side. But owing to commercial intercourse and intermarriage, many persons held property in more countries than one; many possessed two nationalities by birth, and more than two—if nationality could be acquired by residence and interest in a foreign state. In such circumstances, it often became an object of the utmost importance to individuals to ascertain, and of the greatest difficulty to lawyers to determine, whether the laws of one state or of another were to govern questions of sale, succession, status, and the like. As no state could vindicate its jurisdiction beyond its own boundaries, without being guilty of an act of aggression, it became absolutely indispensable that certain general rules should be fixed upon in order to prevent the danger of national hostilities on trifling occasions. The elaboration of these rules constituted a new branch of jurisprudence, to which the title of the C. of L. has been given, but which would be more accurately described as the rules for the solution of that conflict. From the partially independent character which belongs to the different states which constitute the American Union, the labours of the continental jurists in international jurisprudence have been carefully adapted to the requirements of that country; and it is consequently to America and to continental Europe, rather than to the writers of our own country, that we must look for works of importance on this subject. By American writers, the term C. of L. has usually been confined to that branch of the law of nations which treats of the rights and duties of private individuals, and it is consequently synonymous with what elsewhere is called private international law, under which head its various rules will be enumerated in this work. See International Law, Private; Comity of Nations. See Story's *Conflict of Laws*.

**CONFO'RMABLE STRA'TA** are beds which lie parallel to each other.

**CONFRONTÉ**, in Heraldry, means facing or fronting one another. It is the same as combatant.

**CONFU'CIUS**, a celebrated Chinese sage, was born 19th June 551 B.C., at Shang-ping, near the town of Tsěuse, in the petty kingdom of Lu. His own name was Kong, but his disciples called him Kong-fu-tse (i. e., 'Kong, the Master or Teacher'), which the Jesuit missionaries Latinised into Confucius. His mother used to call him Kiĕu ('little hillock'), because he had an unusual elevation on the top of his forehead, with which he is often represented. Various prodigies, as in other instances, were, we are told, the forerunners of his birth. An illustrious pedigree has also been invented for him by his fond disciples, who derive his origin from Hoang-ti, a mythological monarch of China who flourished more than 2000 years B.C. His father, Shuh-leang-ho, died when C. was only three years of age, but he was very carefully brought up by his mother, Yan-she, and from his earliest years, displayed an extraordinary love of learning and veneration for the ancient laws of his country. The prudence, rectitude, and philosophic gravity of his conduct while a boy, are also highly extolled by

Chinese writers. At the age of 17, he was made an inspector of the corn-marts, and distinguished himself by his industry and energy in repressing fraud, and introducing order and integrity into the whole business. When only 19, C. married, but divorced his wife four years after marriage, that he might have more time for study and the performance of his public duties. C. was next appointed inspector-general of pastures and flocks, and the result of his judicious measures, we are told, was a general improvement in the cultivation of the country and the condition of the people. The death of his mother, which happened in his 23d year, interrupted for a time his administrative functions, and gave occasion to the first solemn and important act of C. as a moral reformer. According to the ancient, but then almost forgotten laws of China, children were obliged to resign all public employments on the death of either of their parents; and C., desirous of renewing the observance in his native land of all the practices of venerable antiquity, did not fail to conform to this long neglected enactment. The solemnity and splendour of the burial ceremony with which he honoured the remains of his mother (another old custom which had fallen into disuse), struck his fellow-citizens with astonishment, and they determined, for the future, to bury their dead with the ancient honours. Their example was followed by the neighbouring states, and the whole nation, except the poorest class, has continued the practice to the present day. C. now came to be looked upon as an authority in regard to the past, and ventured to speak as such. He inculcated the necessity of stated acts of homage and respect towards the dead, either at the grave, or in a part of the dwelling-house consecrated for the purpose. Hence, 'the hall of ancestors,' and anniversary feasts of the dead, which now distinguish China as a nation. C. did not end here. He shut himself up in his house to pass in solitude the three years of mourning for his mother, the whole of which time he dedicated to philosophical study. We are told that he reflected deeply on the eternal laws of morality, traced them to their source, imbued his mind with a sense of the duties which they impose indiscriminately on all men, and determined to make them the immutable rules of all his actions. Henceforth, his career is only an illustration of his ethical system. He commenced to instruct his countrymen in the precepts of morality, exhibiting in his own person all the virtues he inculcated on others. Gradually his disciples increased, as the practical character of his philosophy became more apparent. After his 'years of mourning' and meditation were over, C. travelled through various states, in some of which he was employed as a public reformer. On his return to Lu, his reputation was very great, not less than 500 mandarins being among his followers. In fact, it is to be observed, that generally C.'s disciples were not the young and enthusiastic, but men of middle age, sober, grave, respectable, and occupying important public situations. This fact throws light both on the character and design of his philosophy. It was *ethical*, not *religious*, and aimed exclusively at fitting men for conducting themselves honourably and prudently in this life. C. now divided his scholars into four classes: to the first, he taught morals; to the second, rhetoric; to the third, politics; and to the fourth, the perfection of their style in written compositions. While residing at Lu, C. worked industriously in the revision and abridgment of those works which constituted the principal monuments of that ancient literature about which he was always speaking in the language of unbounded reverence.

An unworthy change of magistrates, however, in the kingdom of Lu induced C. to recommence his travels. He first proceeded to Chen, where he was not much appreciated; and afterwards to Tze, where he became one of the king's ministers, but was dismissed after a short time through the intrigues of cunning courtiers. On his return to Lu, he was appointed 'governor of the people.' For a time, his inflexible virtue awed them into morality, and the delighted monarch conferred the highest dignities on the philosopher; but the arrival of a bevy of beautiful syrens from a neighbouring state, which hated the increasing purity of Lu, suddenly overturned the edifice of morality which C. was constructing; and in despair, he again went abroad in search of less vacillating disciples. His later wanderings were very unpropitious; state after state refused to be improved. He was in some instances persecuted; once he was imprisoned, and nearly starved; and finally, seeing no hope of securing the favourable attention of the mass of his countrymen while alive, he returned in extreme poverty to his native state, and spent his last years in the composition of literary works by which posterity at least might be instructed. He died 479 B. C., in the 70th year of his age. Immediately after his death, and notwithstanding the general demoralisation of his contemporaries, C. began to be venerated, and succeeding ages adorned his name with golden epithets. His family, which has continued to the present day, through 67 or 68 generations, in the very place where their ancestor lived, is distinguished by various honours and privileges, being the only example of hereditary aristocracy in China, while in every city down to those of the third order there is a temple to his honour. The 18th day of the second moon is kept sacred by the Chinese as the anniversary of his death.

The system of C. is, rightly considered, the most faithful expression of the Chinese mind, although it is neither the oldest of the extant Chinese religions, nor that which can claim the greatest number of adherents. We have termed it a *religion*, but it ought rather to be regarded as a system of social and political life built upon a slight foundation of philosophy. It contains no trace of a personal God. There are, indeed, a number of allusions to a certain heavenly agency or power, *Shang-te*, whose outward emblem is *Tien*, or the visible firmament; but this Shang-te, in the opinion of the most enlightened Chinese scholars, is nothing more than a verbal personification of 'the ever-present Law and Order and Intelligence, which seem to breathe amid the wonderful activities of physical creation, in the measured circuit of the seasons, in the alternation of light and darkness, in the ebb and flow of tides, and in the harmonious and majestic revolutions of the heavenly bodies.' Sometimes, indeed, C. uses language that might seem to imply more than this. In one of the sacred books, Shang-te is depicted as possessing a high measure of intelligence, and exercising some degree of moral government: he punishes the evil, rewards the good, and is honoured with sacrifice. Immediately after, however, we are informed that his retinue consists of the six Tsong, the mountains, the rivers, and the spirits generally. Elsewhere, the people are enjoined 'to contribute with all their power to the worship of Shang-te, of celebrated mountains, of great rivers, and of the "shin" (spirits) of the four quarters.' Hence we are forced to the conclusion, that C. no more believed Shang-te to be a personal being, than he believed the mountains to be such; and that in describing this Power as possessed of intelligence, and as exercising a moral government, he simply spoke in a pictorial and symbolic way of the laws that govern all things. Perhaps, too, a dim consciousness of a mysterious inexplicable *life* pervading the phenomena and operating through the laws of nature—a feeling probably absent from no human soul—influenced C. to use words which his understanding would not have interpreted in a very literal manner. His highest conception of God, therefore, only reminds one of the *anima mundi* of the classical philosophy; and even this conception is not always present. More than once, his language indicates doubt as to the existence of this great abstraction, and he occasionally 'reprimanded his disciples for prying into matters unconnected with their duties and lying far beyond their depth.' In fact, from metaphysics and theology he equally shrunk. The idea of a creation out of nothing by an infinite and eternal Person, to the end that the glory of his perfections might be seen and felt through the magnificence of material symbols by those intelligences whom in his beneficent condescension he had deigned to create, is utterly unknown to Confucius. He looked on the universe rather as a stupendous, self-sustaining mechanism. He thought that all things existed from eternity, and were subject to a flux and reflux, in obedience to initial laws impressed upon them, how and why, we know not, by some stern necessity. Thus, chaining to the earth, as it were, 'those thoughts that wander through eternity;' crushing, in fact, every spiritual tendency of human nature, by repudiating all speculation, and well-nigh all philosophic investigation of every kind, C. strove to direct the attention of men to the duties of social and political life. 'I teach you nothing,' he says, 'but what you might learn yourselves—viz., the observance of the three fundamental laws of relation between sovereign and subject, father and child, husband and wife; and the five capital virtues—universal charity, impartial justice, conformity to ceremonies and established usages, rectitude of heart and mind, and pure sincerity.' This, in fact, contains the whole doctrine of C.; and it was unquestionably well suited to the prosaic, practical, and conservative mind of the Chinese. It was by the strict and faithful performance of appointed duties, and by the cultivation of proper feelings and sentiments, that C. believed wisdom or knowledge could alone be obtained. He seems to have entertained no doubt that the great virtues of charity, justice, and sincerity might be developed without the help of any spiritual or religious faith, by a species of mechanical discipline. They were natural to the mind, he thought, just as their opposites were unnatural. Here, again, we find a striking example of that easily satisfied unphilosophic *materialism* which characterised C., and has since leavened the Chinese nation so thoroughly. He virtually says: 'Just as I am forced to accept the phenomena of the universe as *facts*, though I can give no explanation of their origin, so am I forced to accept the phenomena of the human mind as *facts*, though I can give no explanation of *their* origin.' C. finds evil and good, wisdom and folly, in the hearts of men. He cannot help making this distinction; some things are bad, others good; such is the oracular utterance of his conscience, which he terms 'the light of intelligence.' He does not, however, advance a step further, and make this moral conviction the basis of a religion. His 'good' has no connection with any God. It exists; we are forced to recognise it as such; that is all we can know. Cultivate it. Those great laws of nature about which we know nothing except that they are realities, are on its side. Do not foster what you know to be mean and unworthy, for 'he who offends against Heaven has no one to whom he can pray.' 'Imperial Heaven will only assist virtue.' From this stand-point, C. taught a simple and comprehensive rule of life, both private and public. First, let every man govern himself according to the sacred maxims; then his family according to the same; and finally, let him render to the emperor, who is the father of his people, such filial obedience as he demands of his own children, and worship him with the same veneration as he does his own ancestors; for thus will domestic peace, social order, and the safety of the commonwealth be preserved. To further this end (and in accordance with his belief that by instruction in the sacred precepts everything desirable could be accomplished), C. inculcated the necessity of universal education, and, in consequence, schools are diffused throughout the length and breadth of the empire, penetrating even to the remotest villages, where the maxims of the philosopher are taught, whose influence is thus perpetuated from generation to generation.

Confucianism appeals to 'practical' men. It lauds the present world; rather doubts, than otherwise, the existence of a future one; and calls upon all to cultivate such virtues as are seemly in citizens—industry, modesty, sobriety, gravity, decorum, and thoughtfulness. It also counsels men to take part in whatever religious services have been established from of old. 'There may be some meaning in them, and they may affect your welfare in a way you do not know of. As for the genii and spirits, sacrifice to them: I have nothing to tell regarding them, whether they exist or not; but their worship is part of an august and awful ceremonial, which a wise man will not neglect or despise.' Confucianism, in consequence, almost immediately after the death of its author, became the religion of the state, to which it has proved an admirable ally; its theory of government being nothing less than a paternal despotism. The entire literary class in China are also followers of C., and, in fact, for many ages the literature of China has consisted exclusively of commentaries on the five canonical books which C. professed to merely abridge, and of four others, which were composed partly by himself and partly by his disciples, and which, together with the former, constitute the nine Chinese classics.

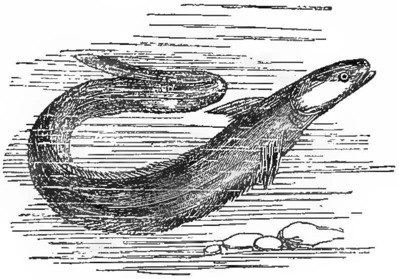
The five canonical books are the *Yih-king*—originally a cosmological essay, now, curiously enough, regarded as a treatise on ethics; the *Shu-king*—a history of the deliberations between the emperors Yaou and Shun, and other personages, called by C. the *Ancient Kings*, and for whose maxims and actions he had the highest veneration; the *Shi-king*—a book of sacred songs, consisting of 311 poems, the best of which every well-educated Chinaman gets by heart; the *Le-king*—the Book of Rites, the foundation of Chinese manners, prescribing, as it does, the ceremonies to be observed in all the relationships of life, and the great cause of the unchangeableness and artificiality of Chinese habits; and the *Chun-tsien*—a history by C. of his own times, and those which immediately preceded him. The first of the 'Four Books' is the *Ta-hëö*, or 'Great Study,' a political work, in which every kind of government, from the domestic to the imperial, is shewn to be essentially the same—viz., parental; the second is *Chung-yung*, or 'the Invariable in the Mean,' a book devoted to teaching men what is 'the due medium,' or the golden mean, to observe in their conduct; the third is the *Tun-yu*, or 'Philosophical Dialogues,' containing the recorded conversations of C., and the best book for obtaining a correct knowledge of his character; and the fourth is the *Hi-tse*, written by Meng-tse, or Mencius, who died 317 B.C., and who was by far the greatest of the early Confucians. The main object of this work is to inculcate philanthropic government.

It is proper to observe, in conclusion, that in the course of centuries the defects of the system of C. made themselves felt even to the unspiritual Chinese mind; and the necessity of 'speaking out far more plainly, not on matters of finance, economy, and etiquette, but on the nature of the world and its inhabitants, and the true relation of the seen and temporal to the absolute and the all-embracing, was recognised. The philosopher who guided this great movement to a prosperous close was Tehu-he (died 1200 A.D.), is termed by European scholars the Chinese Aristotle, and regarded by all the governing class in China as 'the prince of science.' His innumerable works are laboriously studied by the higher literary class, and are considered the standard of metaphysical or religious orthodoxy, but the mass of ordinary Confucians never pass beyond the ceremonial ethics of their master.

For further information regarding Confucius and his system, see article CHINESE EMPIRE.

**CONGÉ D'ÉLIRE** (Norman-French), the name given in England to the king's warrant or permission to a dean and chapter to proceed to the election of a bishop to a vacant see. Since the passing of the statute 25 Henry VIII. c. 20, the C. d'É. has always been accompanied by a letter-missive from the king, mentioning the person to be elected by name, so that in reality it is a nomination by the crown. If the dean and chapter delay the election beyond twelve days, the nomination is effected by letters-patent from the crown; if they delay beyond twenty days, or elect another than the person named, they incur the penalties of a *præmunire*, i. e., loss of civil rights, forfeiture of their goods, and imprisonment during the royal pleasure.—Stephen's *Commentaries*, vol. iii. p. 8.

**CO'NGER**, or **CO'NGER-EEL** (*Conger*), a genus of marine fishes of the eel family (*Murænidæ*), having the tail more elongated and pointed than the fresh-water eels, the dorsal fin commencing much nearer the head, and the teeth of the upper jaw, although slender, placed so close together as to form a cutting edge. The species are not numerous. One only (*C. vulgaris*) is a native of the British seas. It is common on all parts of the coast, and is found both among rocks and on banks. Its form much resembles that of a fresh-water eel; its colour is brown above, passing into dull white beneath; the fins whitish, edged with black; and the lateral line almost white. It attains a large size, often five or six feet long; sometimes ten feet, and eighteen inches in circumference, weighing more than one hundred pounds. It possesses great strength, and is a formidable antagonist when hauled into a boat by the fisherman's line, or found among the rocks, where it is sometimes left by the retiring tide. Great numbers are, however, taken in order to be used as food, although not highly esteemed, and chiefly consumed by the poorer classes. The principal C. fishery of Britain is on the Cornish coast, and it is not uncommon for a boat with three men to bring on shore from a ton to two tons as the produce of a night's fishing, the C. being caught most readily during the night; but there are banks off the French coast still more productive. Sand-launces, pilchards, &c., are used for bait. The C. is extremely voracious.



Conger-Eel.

**CONGE'STION OF BLOOD**, also called Fulness of Blood, Vascular Turgescence, Hyperæmia (*hyper*, excess; *aima*, blood), is a condition to which probably far too much importance has been attached by medical writers. Congestions are described as being either *active* or *passive*. But active congestions are always essentially parts of a further morbid process, such as inflammation (q. v.), tumour (q. v.), or softening of texture; while passive congestions are almost always determined by some mechanical cause of obstructed or retarded circulation. It results from this view of its pathology, that congestion alone can hardly ever require treatment, or be anything else than one among other indications of disease.

**CO'NGLETON**, a market-town in the east of Cheshire, picturesquely situated in a deep valley, with well-timbered hedgerows, on the banks of the Dane, 33 miles east of Chester. It is a mile long, with many houses built of wood and plaster, and has silk spinning and throwing, with manufactures of silk ribbons, and other silk fabrics. There are coal-mines near. Pop. 10,520.

**CONGLO'MERATE**, or **PLUMPU'DDING-STONE**, a rock consisting of round, water-worn pebbles, compacted together into stone. These pebbles consist of portions of hard rock, frequently of quartz. They can sometimes be traced to their parent rock. Their rubbing and polishing must have been a work of considerable time, but their deposition in the beds in which they occur has been performed speedily, the materials having been brought together by a strong current. They are united together by a silicious, calcareous, or ferruginous cement, sometimes so loosely, that they are easily separated by a slight blow from a hammer; at other times, the matrix is as hard as the pebbles which it contains, and clasps them so firmly, that the rock breaks, as if it were a homogeneous mass. The pebbles vary in size, occasionally being several feet in diameter; but they are generally about the size of, or smaller than a walnut.

**CO'NGO**, in the widest sense of the name, includes all the countries on the west coast of Africa lying between the equator and lat. 18° S.; but more definitely the name is given to the territory lying between the rivers Dando and Congo, or Zaire—i. e., between about lat. 8° 20′ and 6° S. How far it stretches inland from the Atlantic, is not exactly known. The river Congo—the source of which is not satisfactorily determined, but which is said by the natives to rise in a marsh about lat. 2° 15′ N., long. 17° 30′ E.—after a rapid course, parts of which are broken by numerous cataracts, enters the Atlantic in lat. 6° S., long. 13° 30′ E. It is an immense body of water, being some ten miles wide at its mouth, and six or seven miles across at a very considerable distance from the sea. Its depth, at its mouth, was not found with a line of 160 fathoms. The kingdom of C. is divided into two distinct districts, a coast-land, and a terrace-land in the interior. The first is level and well watered, but intolerably sultry, and productive only in the parts near the sea-shore. The higher, interior terraced land has a modified and comparatively mild climate, and is remarkably fertile, producing oil-palms, tobacco, sugar, yams, oranges, lemons, &c. Its wild animals are those common to West Africa. The natives of C. and the bordering lands speak one copious and harmonious negro-language, which forms the chief stock of the two negro dialects of South Africa; but a distinct dialect seems to be spoken by the Moci-Congis, a wild and martial people of the interior highlands. The Schaggas, another race of people in the interior, are described as very savage and cruel. These and other neighbouring tribes bear the general negro type, but with some admixture of the Kaffir. The genuine natives of C. are good-natured and hospitable, but very indolent. Their intercourse with the Portuguese, who long exercised a considerable sway over them by their missionaries, has not tended greatly towards their civilisation. In 1490, as many as 100,000 were baptized by the command of the king; but Christianity has now little influence. Some of the ceremonies, however, are still kept up. For instance, when a king of C. dies, the body is wrapped up in a great many folds of cloth, until a priest come from Loanda to consecrate it. The capital is Banza, called San Salvador by the Portuguese. The population is not ascertained, but is supposed to be dense in the interior.

**CONGREGA'TION** (Lat. *con*, together; *grex*, a flock), an assembly, generally a religious assembly; in its most ordinary use, an assembly of Christians met in one place for worship. See CHURCH.—In the Roman Catholic Church, it often designates a sort of board of cardinals, prelates, and divines, to which is intrusted the management of some important branch of the affairs of the church. Thus the *C. of the Index* examines books and decides on their fitness for general perusal. See INDEX. The *C. De Propaganda Fide* consults as to the advancement of the Roman Catholic religion throughout the world. See PROPAGANDA FIDE, DE. The *C. of Relics* inquires into the genuineness of supposed relics. The *C. of the Holy Office* takes cognizance of heresies, &c. See INQUISITION. The *C. of Rites* regulates the festivals and offices of new saints. There are numerous other congregations.

**CONGREGA'TIONALISTS.** See INDEPENDENTS.

**CO'NGRESS**, an assembly either of sovereign princes, or of the delegated representatives of sovereign states, for the purpose of considering matters of international interest. Even in America, though the term has now a different meaning (see UNITED STATES), it had a similar origin, the first C. being that of the delegates from the various British colonies, who met on the 7th October 1765, for the purpose of considering their grievances. In like manner, in Belgium, on the 4th October 1830, a C. of deputies from the different provinces was held for the purpose of adjusting the new constitution. Previous to signing a treaty of peace, a meeting of plenipotentiaries usually takes place, to which the name of a C. is sometimes applied, though it seems more properly to be reserved for those more important meetings at which extensive schemes of future policy are determined on, and the balance of power amongst the various European states readjusted. To this class belonged the famous C. of Vienna at the termination of the great war in 1815; the C. of Carlsbad in 1819, for regulating the affairs of Germany; that of Laybach in 1820, for deliberating on the condition of Spain, Portugal, and Naples; and many others. As the envoys to a C. are not sent to one sovereign in particular, a modification of the ceremonial recognised by the law of nations for the recognition of ambassadors takes place. There is no presentation of credentials, but in place of it an exchange of the full powers or warrants of the respective members. If a mediator has been appointed, it is to him that the letters of credence, and notes and counter-notes, are addressed, and by him that the negotiations are directed. There is scarcely any difference between a C. and a diplomatic conference—such, for example, as that of London in 1826, for determining the fate of Greece.

**CO'NGREVE, WILLIAM**, the second son of Richard Congreve, Esq., of Congreve and Stretton, was born about 1672, at Bardsey, Yorkshire. Educated at Kilkenny, and at Trinity College, Dublin, he in 1688 returned to England, and was entered at the Middle Temple, but he does not seem to have taken kindly to law. His first publication was a novel, entitled *Incognita, or Love and Duty Reconciled*, a performance which Dr Johnson said he would rather praise than read, but which has been neither read nor praised by succeeding critics. His first play, *The Old Bachelor*, was produced at Drury Lane when C. was in his 19th year, and its success was remarkable. Next year he came out with *The Double Dealer*, which was a comparative failure; but his comedy *Love for Love*, published in 1695, was a great success, and brought to its author money and fame. *The Mourning Bride*, a blank-verse tragedy, written after the manner of the old passionate masters, came out in 1697. Its success was enormous, far exceeding that of his comedies, but it has long since fallen from its high estate. Two years after, he produced his comedy, entitled *The Way of the World*, which failed completely, and disgusted him with the theatre. In other respects, C. was a fortunate man. He held various offices, which together yielded him an income of £1200. C. affected to despise his theatrical triumphs, and cultivated the modish airs of the fine gentleman, an eccentricity which laid him open to rebuke when he was visited by Voltaire. In his later days, he was afflicted by gout and blindness. He died 19th of January 1729, at his house at Surrey Street, in the Strand, London, at the age of 57, and was buried in Westminster Abbey, nobles supporting the pall.

As a writer of comedies, C. takes a high place, but not the highest. His plots are intricate and confused, and his dialogue is defiled by all the grossness of his age. He has none of those touches of nature that make the whole world kin. The element in which he moves is intrigue. His world is composed of wives, gallants, and husbands; and the wives and the gallants are in a continual conspiracy against the husbands. What strikes the reader of these plays, is the superabundant wit. But there is no discrimination or keeping in the brilliancy. The shoeblack is as witty as the hero. C. has so many good things to say, that he is glad to get a mouth to stick them in. He is the wittiest and the least amusing of writers. He has no heart, no generosity, no humour. His splendour is frosty, and the innumerable flashing points dazzle the eye, and make the brain ache.

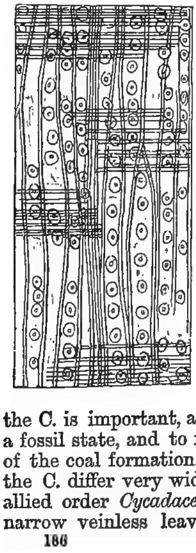
**CONGREVE ROCKET.** See ROCKET.

**CO'NGRUOUS.** In Geometry, the term congruity is applied to lines and figures which exactly correspond when laid over one another. See COINCIDENCE. In Arithmetic, two numbers are said to be C., with respect to a third, when their difference is exactly divisible by it. Thus, 12 and 7 are C. with respect to 5, as $\frac{12-7}{5} = 1$, and so are 27 and 12, as $\frac{27-12}{5} = 3$. The numbers considered must be whole numbers. When two numbers are C. to a third, either is called a *residual* of the other with respect to the third. C. numbers possess many curious properties, which have been applied by Gauss and other writers in the investigation of the properties of numbers.

**CO'NI**, or **CUNE'O**, capital of a province or division of Piedmont of the same name, stands at the junction of the Stura and the Gesso, in a pleasant, fruitful, and well-cultivated district, 48 miles south-west of Turin. Pop. 20,500. The principal street is handsome, with arched piazzas; and there are several large churches, convents, and palaces. Its chief manufactures are silk and woollen cloth. Owing to its position on the road between Nice and Turin, it enjoys a brisk traffic, and is the entrepôt for merchandise from Nice destined for Lombardy, Switzerland, and Germany. Two well-frequented fairs are held. C. was once a fortified place, and had to undergo several sieges. After being taken and retaken, the victory of Marengo gave it into the hands of the French, who demolished the fortifications, and turned them into promenades.

**CO'NIC SECTIONS.** See Cone, Circle, Ellipse, Parabola, and Hyperbola.

**CONI'FERÆ** (Lat. cone-bearers), an important natural order of exogenous plants, containing the pines, firs, juniper, yew, &c.; agreeing with the other exogenous orders generally in the structure of the stem and in the mode of vegetation, but differing remarkably from most of them in having naked ovules—i. e., ovules which are not enclosed in an ovary, but are fertilised by the direct application of the pollen to the *foramen*, without the intervention of style or stigma—and upon this account separated from them, along with *Cycadaceæ* (q. v.), by Lindley, Endlicher, and others, as a distinct class, under the name *Gymnogens* or *Gymnospermæ*. The flowers are unisexual, the male and female sometimes on the same, sometimes on separate plants; the male flowers have either one stamen or one bundle of stamens, the anthers often crested; the female flowers are in cones or solitary; the place of ovaries is supplied by the flat scales of the cones, the ovules are usually in pairs on the face of the scales, either inverted or erect. The fruit is either a cone—the scales of which sometimes become fleshy, and are incorporated into a berry-like fruit—or a solitary naked seed. The seed has a hard crustaceous integument; the embryo is in the midst of fleshy oily albumen; the cotyledons are either two, or numerous and whorled. The mode of branching is peculiar, numerous buds proceeding from the side of the main stem, so as generally to form whorls of branches, which are generally almost horizontal in their direction, whilst the central vertical shoot runs up often with admirable straightness, and some of the C. attain a height unrivalled among other forest-trees, of which the *Wellingtonia* (q. v.) of California affords the most noble example. The wood consists of *punctated* cells; the sides of the tubes or elongated cells which form it, and which are nearly of equal diameter, being marked by circular discs, which, when highly magnified, exhibit a small internal circle surrounded by a larger external one. The annexed cut represents a longitudinal section of part of the stem of a fir, highly magnified, shewing the discs. This peculiarity of the wood of the C. is important, as enabling us to recognise it in a fossil state, and to refer many fossils, particularly of the coal formation, to this order. The leaves of the C. differ very widely from those of the closely allied order *Cycadaceæ*. Most of the C. have very narrow veinless leaves, so that the Germans call them *Needle-woods* (Nadelhölzer) in contradistinction to the other European forest-trees, which they call *Leaf-woods* (Laubhölzer). By far the greater number of them belong to the northern hemisphere. The C. are very long-lived; some of them are supposed to be capable of attaining an age of 2000 or 3000 years. When the stem of a coniferous-tree is cut across, it does not sprout again from the root. The C., besides the great usefulness of the timber of many, are remarkably productive of Turpentines (q. v.) and Resins (q. v.). Astringent substances are also found in their bark, and fixed oil in their seeds. The seeds of some species of *Pine* and *Araucaria* are used as food.



The C. are divided into—1. *Abietineæ*, having inverted ovules and woody cones, as the pines, firs, larch, cedar, araucaria, &c. 2. *Cupressineæ*, with erect ovules, and either woody or fleshy cones, as the juniper, arbor-vitæ, cypress, &c. 3. *Taxineæ*, with solitary seeds, as the yew, gingko, &c. 4. *Gnetaceæ*, plants of comparatively humble growth, with jointed stems, often regarded as forming a distinct order. See Sea-grape. Lindley and others also make the *Taxineæ* a distinct order. See Yew.

**CONIRO'STRES**, a tribe or section of the order of birds called *Insessores*, and characterised by a strong conical bill, without notches. The feet are, in general, adapted for walking on the ground, as well as for perching. The bill varies much in its thickness, and those species in which it is thickest, in general feed most exclusively on seeds. The number of birds belonging to this tribe is very great; and the families differ much in many respects. Among them are finches, sparrows, buntings, linnets, larks, plantain-eaters, colies, crows, birds-of-paradise, starlings, and even hornbills.

**CO'NIUM.** See Hemlock.

**CO'NJUGAL RIGHTS.** See Marriage.

**CONJUGA'TION** (Lat. a connecting or yoking together), a term in Grammar applied to a connected view or statement of the changes of form that a Verb (q. v.) undergoes in its various relations. See Inflection. The forms usually included under this term are those that serve to mark: 1. *Person*, or the distinction between the speaker, the spoken-to, and the spoken-about; as (I) *write*, (thou) *writest*, (he) *writes*. 2. *Number;* as (John) *writes*, (they) *write*. 3. *Tense*, or time; as (I) *write*, *wrote*, *have written*, *will write*. 4. *Mood*, or the manner in which the action is presented. When the action is simply asserted, it is the Indicative mood, as (he) *wrote;* when put as a supposition or condition, it is the Conditional mood, as, *if he wrote*. The Potential mood expresses the power of doing the action, as, *he can write;* and the Imperative commands the doing of it—*write*. The Infinitive mood expresses the action without limitation of any kind—*to write;* as it makes no affirmation, it is, strictly speaking, not a verb, but a kind of abstract noun. The two participles, the one expressing the action as in progress (*writing*), the other as completed (*written*), may be classed with the infinitive, as not affirming anything. In opposition to the infinitive and the participles, the other parts of the verb are called Finite. 5. *Voice*, or the distinction between Active and Passive (see Verb); as (he) *wrote* (the letter), (the letter) *was written* (by him).

In English, and in most modern European languages, the greater part of those distinctions are indicated by separate words; in Sanscrit, Greek, and Latin, they were nearly all indicated by prefixes and affixes, or other modifications of the word itself. The nature and origin of these modifications are considered under the head Inflection. All verbs do not take the same changes even in the same language. Although the affixes, e. g., may have originally been the same, yet they underwent, in course of time, different kinds of corruption or obliteration, depending upon the nature of the letters in the root verb. This leads to the verbs of a language being arranged in different classes or conjugations. In Latin, for instance, grammarians recognise four conjugations, and verbs that cannot be brought into any class are called Irregular Verbs.

In English, there are two distinct types of the inflection of verbs; thus, *I love*, becomes in the past tense, *I loved*, and in the passive voice, *I am loved;* while *he shakes* becomes *he shook*, and *he was shaken.* Verbs that, like *love*, take *d* (or *ed*—sometimes *t*) in their past tense and past participle, form one class or C.; and those resembling *shake* in their changes form another. The former class is by far the most numerous; but the latter includes the most commonly used and oldest verbs in the language. The mode of change seen in *shake*, *shook*, *shaken*, is believed to be more ancient than the other, and is therefore called the Old C., and sometimes, the Strong C., the other being the New or Weak. The verbs belonging to the old C. are all of Saxon origin, and are primitive or root verbs; while derivative verbs belong to the other class. Verbs of the weak C. are pretty uniform in taking *d* or *ed*, although after certain letters the *d* is of necessity pronounced as *t*, and is sometimes replaced by that letter in writing—*dipt*. With regard to verbs of the strong C., no rule can be given as to the change of vowel by which the past tense is formed. It was made at first, no doubt, according to felt laws of euphony; and even yet a certain 'method' may be discerned 'in their madness.' Thus:

1. Rise, rose; smite, smote; ride, rode; drive, drove, &c.
2. Cleave, clove; steal, stole; speak, spoke; tear, tore, &c.
3. Swim, swam or swum; sing, sang or sung; ring, rang or rung, &c.

For further information on the C. of English verbs, see Latham's *English Language*, or Chambers's *Information for the People* (ed. 1857), vol. ii., art. 'English Grammar.'

**CONJUGATION OF CELLS**, a union of two distinct cells of a plant, in order to reproduction. It has been observed only in the *Confervaceæ* and *Diatomaceæ*. Two cells come into contact, as by two filaments of a *Conferva* being brought together, and little projections are formed from each, the points of which are absorbed, and thus a tube is formed, through which one of the cells empties itself into the other. The latter then becomes a *mother-cell*, and produces spores.

**CO'NJUNCT AND CO'NFIDENT.** See INSOLVENCY.

**CONJU'NCTION**, in Astronomy, is one of the Aspects (q. v.) of the planets. Two heavenly bodies are in C. when they have the same longitude—that is, when the same perpendicular to the ecliptic passes through both. If they have, at the same time, the same latitude—that is, if they are both equally far north or south of the ecliptic—they appear from the earth to be in the same spot of the heavens, and to cover one another. The sun and moon are in C. at the period of new moon. In the case of the inferior planets, Mercury and Venus, there is an inferior C. when the planet is between the earth and the sun, and a superior, when the sun is between the earth and the planet. In general, a heavenly body is in C. with the sun, when it is on the same side of the earth and in a line with him; and it is in *opposition* to the sun, when it is on the opposite side of the earth, the earth being in a line between it and the sun. Planets are invisible when in C. with the sun, except in rare cases when an inferior planet passes over the sun's disk, and may be seen as a speck on his surface. Conjunctions are either *geocentric* or *heliocentric*, according as they are actually witnessed from the earth, or as they would be witnessed if observed from the sun. In observing a C. from the earth's surface, it is usual to reduce the observation to what it would be if made from the earth's centre; by this means, the exact times of C. are more accurately fixed, and the observations of one astronomer made available to every other, wherever he may be on the earth's surface. *Grand conjunctions* are those where several stars or planets are found together. The Chinese history records one in the reign of the Emperor Tehuen-hiu (2514—2436 B. C.), which astronomers calculate to have actually taken place.

**CONJUNCTIONS**, one of the 'parts of speech,' or classes, into which grammarians divide words. C. serve the purpose of connecting sentences, parts of sentences, and single words; as, 'Day ends, *and* night begins. William *and* John learn Latin. Charles *and* James carried the basket between them.' In the first sentence, *and* connects two separate affirmations into one compound sentence. The same is true in the second—the separate affirmations being 'William learns Latin,' and 'John learns Latin.' In the third sentence, *and* connects only the two words, 'Charles' and 'James,' as it cannot be affirmed of either of them alone that he 'carried the basket.' In most cases, however, it can be shewn that, logically at least, two affirmations are involved, and that the conjunction really connects the affirmations. It is not easy to distinguish C. from adverbs. In fact, C. were all originally other parts of speech; and the greater part of them are still really adverbs, and owe their conjunctive effect to their signification as adverbs. In *and* and *but*, whatever may have been the original meaning, we now attend only to the conjunctive effect; *or* is a shortened form of the pronominal adjective *other;* and *nor* is *or* with the negative prefixed. In such a sentence as, 'I believe that you are wrong,' *that* is the demonstrative pronoun, equivalent to—I believe *this*, viz., 'you are wrong.' This is clearly seen in the corresponding words in other languages: Ger. *dass*, Fr. *que*, Lat. *quod* (for the relatives were originally demonstrative pronouns). All the rest might be called Adverbial C. or Conjunctive Adverbs. Ex., 'He is industrious; *therefore* he is happy'—that is, 'he is happy *for that.*' This adverb, or adverbial phrase, expressive of the cause of the happiness, by referring us back for its meaning to the former assertion, has the effect of connecting the two assertions in the mind. Again, 'The messenger arrived *while* he was speaking.' Here *while* is equivalent to, *at the time at which* (he was speaking). As an adverbial phrase, this simply indicates the time of the act of 'arriving;' but as it also expresses that the speaking was going on at the same time, it thus conjoins the two assertions.

The most important distinction among C. will be seen in the following pair of sentences:

> The sun went down, *and* the moon rose.
> The moon rose, *as* the sun went down.

The first (compound) sentence contains two simple sentences or assertions, linked together, yet each standing on an independent footing; the two are joined on terms of equality, and are therefore said to be *co-ordinate*, and the conjunction is called a Co-ordinating Conjunction. In the second sentence, the last clause, though a grammatical sentence, contains no logical proposition, no assertion made for its own sake, but merely states a fact as a modifying circumstance with regard to the assertion contained in the first clause. The sentence of the second clause is therefore *subordinate* to that of the first, and the conjunction that marks the relation, a Subordinating Conjunction. The chief Co-ordinating C. are:

1. *And, also, likewise, not only—but, partly—partly, first—then, further.* All these are used to tack on sentences whose sense accords with, or adds to, the effect of what goes before. Hence they might be called *cumulative* conjunctions. The following (2) mark various degrees of opposition in the sense or effect of the sentences, and might be called *adversative* conjunctions. These terms seem preferable to *conjunctive* and *disjunctive*, generally used.

2. (*a.*) *Not—but, else, otherwise* (Exclusive).
(*b.*) *Either—or, neither—nor* (Alternative).
(*c.*) *But, only, yet, still, at the same time, nevertheless.*

3. *Therefore, wherefore, for, thus, consequently, hence, accordingly, so, so that.* (Cause and effect.)

All other C. may be classed as Subordinating, such being their usual function. Those in most common use are: *Although, as, as well as, so—as, as—as, because, if, lest, since, than, that, in order that, though, unless, whether, when, before, after, while.*

**CONJU'NCTLY AND SE'VERALLY,** in the law of Scotland, corresponds to jointly and severally in England, and denotes a form of obligation by which each of several obligants becomes bound for the whole. The creditor in such circumstances has his option either to exact the obligation proportionately from each of the co-obligants, or to select one of them, and exact the whole from him, leaving him to seek his relief against the others.

**CONN, Lough,** a lake in the north of Mayo county, Ireland, and with Lough Cullin (from which it is separated by a narrow neck of land), 13 miles long, and 1 to 3 broad. It lies in a wild romantic region of hills, glens, rocky slopes, precipices, broken ground, and bogs. It contains isles, has bold shores, and is 40 feet above the sea. To the west, are hills stretching to Mount Nephin, which has a height of 2646 feet.

**CONNARA'CEÆ,** a natural order of dicotyledonous or exogenous plants, consisting of trees and shrubs, sometimes climbing, with compound alternate leaves, destitute of stipules; the flowers in racemes or panicles. Resinous juices do not occur in this order. Forty or fifty species are known, all tropical. The best known product of this order is the beautiful wood called Zebra Wood, the wood of a large tree which grows in Guiana, *Omphalobium Lamberti*. The fruit of some species of *Omphalobium* is eaten; the eatable part is the fleshy aril.

**CO'NNAUGHT,** the westmost and smallest of the four provinces of Ireland. It is bounded N. and W. by the Atlantic; E. by Ulster and Leinster, from which it is separated by the Shannon; and S. by Munster. It contains the counties of Galway, Leitrim, Mayo, Roscommon, and Sligo. Greatest length from north to south, from Tullaghan, on Donegal Bay, to Mount Shannon on the borders of Loch Derg, 105 miles; greatest breadth, along the 54th line of latitude, and not including Achil Island, 92 miles. Area, 6863 square miles. Pop. (1851) 1,021,006. Along the coast, particularly on the west, are many fine bays and harbours. Its surface, especially in the west, is mountainous and rugged, and the scenery here is remarkable for its grandeur and picturesque beauty. (For detailed information, see the respective counties.) The people are still almost purely Celtic. In the times of the Irish pentarchy, the O'Connors were kings of Connaught. In 1590, the province was divided into six counties, those above mentioned, with Clare (which was afterwards joined to Munster). It then lost its independence, and came under English administration.

**CONNE'CTICUT,** the largest river to the east of the Hudson in the United States, rises on the south border of Lower Canada, near lat. 45° N., and, after a fall of 1600 feet and a south-south-west course of at least 400 miles, enters Long Island Sound, in lat. 41° 16′ N. With the exception of the state of Maine, it may be said to be the chief artery of the whole of New England, separating New Hampshire on the east from Vermont on the west, and afterwards crossing successively Massachusetts and the state of its own name. It is navigable up to Hartford, a distance of 50 miles, for a draught of eight feet; and up to Middletown, which is 16 miles nearer the sea, for a draught of ten feet; while, with a few subsidiary canals, it carries barges of eight or ten tons fully 200 miles above the former city. The C. has many alluvial intervals on its banks, which, being generally inundated in the spring, are remarkable for their fertility. The stream is famous both for the quantity and the quality of its shad; and its valley, about forty miles wide, presents a considerable variety of romantic scenery.

**CONNECTICUT,** the most south-westerly state of New England in the United States, and one of the original members of the great confederacy, is situated in lat. 41°—42° 3′ N., and long. 71° 55′—73° 50′ W. Area, 4674 square miles. Between 1790 and 1850, the inhabitants had increased from 238,141 to 370,791—being on the average an advance of barely 1 per cent. per annum. A result so anomalous, where the general population doubles itself in a quarter of a century, is creditably explained by the fact, that to all the new states of the Union C. has uniformly been a nursery of educated men of every class—of merchants and agriculturists, of lawyers and statesmen. According to the census of 1850, the state, besides its two senators in the upper house of Congress, sends four representatives to the lower, appointing, as the sum of both, six presidential electors. Under the existing constitution, which superseded the charter of Charles II. only in 1818, the local authorities are a governor, a lieutenant-governor, a senate of 21 members, an assembly of 215 representatives, and a supreme court. Between 1850 and 1859, the assessed value of taxable property, personal as well as real, appears to have risen from 119,088,672 dollars to 214,189,319. Respectively to the west and east of Connecticut river are the Housatonic and the Thames, of which the former is navigable 12 miles upwards, and the latter 14. Many smaller streams afford valuable water-power. Besides the New Haven and Farmington Canal, of 16 miles in length, C. is traversed in almost every direction by railways. The chief towns are Hartford, New Haven, Middletown, New London, and Norwich—the second and fourth being the principal ports, and all of them being accessible from the sea. The colleges are three in number; and the schools of every grade may stand a comparison with any in the Union. As the soil is equally fitted for pasturage and for tillage, the staple productions are butter, cheese, wool, maize, oats, barley, wheat, flax, hemp, tobacco, and cider. The minerals are iron, plumbago, marble, and freestone. The imports and exports respectively average about 400,000 and 500,000 dollars. The registered vessels measure 125,000 tons—about one-fifth of the whole tonnage being employed in the whale-fishery.

**CONNOISSEUR** (Fr.), the French term by which we commonly designate persons who, without being themselves artists, are supposed to possess a discriminating knowledge of the merits of works of art. They are called by the Italians Cognoscenti. See DILETTANTI.

**CO'NOID,** a solid formed by the revolution of a conic section round its axis; such are the sphere, paraboloid, ellipsoid, and hyperboloid.

**CO'NQUEST.** In the law of succession in Scotland, heritable property acquired during the lifetime of the deceased, by purchase, donation, or excambion, is called C., in opposition to that to which he has succeeded, which is called Heritage. In the event of one dying intestate leaving only brothers, but brothers both older and younger than himself, or of his leaving uncles both older and younger than his father, or the issue of such brothers or uncles, these two kinds of property follow different lines of succession, the heritage descending to the younger brothers or uncles, the C. ascending to the elder brothers or uncles, each in his respective degree. C., in a marriage-contract, merely means the difference between the possessions of the husband before and after marriage, allowance being made for the increased expenditure; or that by which he has been made richer (locupletior). Such property is frequently settled either on the heir or on the issue of the marriage.

**CO'NRAD.** See KONRAD.

**CONSA'LVI,** ERCOLE, CARDINAL, a distinguished reformer of abuses in the Papal States, was born at Rome, June 8, 1757. He was made cardinal and secretary of state by Pope Pius VII., and in this capacity concluded the concordat with Napoleon in 1801. His stanch maintenance of the rights of his own sovereign against the insidious encroachments of France offended Napoleon, who in 1806 demanded his removal from office; and the pope at last unwillingly consented, on the desire of C. himself, who was anxious that peace should continue. He was, however, again employed in 1815 in all the transactions between Rome and Paris, and also in settling the internal affairs of the Papal States. In the latter capacity, he reformed numerous abuses; and the measure known as the *Motu Proprio,* introduced by him in 1816, suppressed all monopolies, feudal taxes, and exclusive rights. He was a liberal patron of science, but especially of the fine arts, and employed his leisure in the study of literature and music. In diplomacy, he displayed great address, and was generally successful. He died in Rome, January 24, 1824.

**CONSANGUI'NITY** is relationship by blood, as distinguished from Affinity (q. v.), or connection by marriage. C. is either *direct* or *lineal*—that is to say, in a line constituted by persons generating and generated, whether it be regarded in an ascending or descending point of view; or it is *collateral, oblique,* or *transverse*—that is, where the persons related are not descended the one from the other, but are all descended from a common parent. To persons related in the direct line belong parents and children, grandchildren, &c., to the remotest degree; to those related in the collateral line belong brothers and sisters, uncles and nephews, aunts, nieces, cousins, and the like. In computing the degrees of collateral C., a different system was adopted by the Roman and the canon law. According to the first, each person was counted as forming a degree, so that brothers, being each removed one degree from the father, were in the second degree to each other; according to the second, the number of generations on one side only was reckoned, so that brothers were in the first, and cousins-german in the second degree, instead of the fourth, as by the Roman computation. In the unequal collateral line, again, i. e., where one of the two persons is further removed than the other from the common stock, the canon law reckoned the distance by the number of generations of the person furthest removed. 'Thus, a niece is related in the second degree to her uncle, because she is related in the second degree to her grandfather, the common stock; and by the same rule, she is no further removed from her uncle's son; which abundantly discovers the absurdity of that method of reckoning.'—Erskine's *Institute,* b. i. tit. vi. s. 8.

The different methods in which the degrees of C. and affinity are computed in England and Scotland will be explained under MARRIAGE, SUCCESSION, HEIR, &c.

**CO'NSCIENCE.** See ETHICS.

**CONSCIENCE,** COURTS OF, IN ENGLAND. These were courts for the recovery of small debts, constituted by special local acts of parliament in London, Westminster, and other trading districts. These courts were also called *Courts of Requests.* On the establishment of county courts, the courts of C., with a few exceptions, were abolished. See COUNTY COURTS.

**CONSCIENCE,** HENDRICK, the most fertile and original writer of fiction in Belgium, was born December 3, 1812, at Antwerp, where his father was inspector of the dockyards, until he became a dealer in waste-paper, old books, &c. C. educated himself by the aid of his father's miscellaneous store of books until his 15th year, when he entered a school, where he was engaged to assist the master in teaching. On the breaking out of the revolution in 1830, C. joined the ranks under General Niellon, and served till 1834, when he left the service, being disgusted with the stricter discipline that was being introduced. Having failed in all his attempts to obtain employment, he tried his hand at writing, and composed in Flemish the novel, *In het Wonderjaer* 1566 (Ghent, 1837), which, notwithstanding its unprecedented success, left him in debt with his printer. His father refused to do anything for him until he took up some regular employment; and he was thus driven from home in an almost penniless state. At this time, the painter Wappers interested himself for him, and procured him some slight assistance from the king. C. now wrote his *Phantasia,* a collection of fantastic tales, and his celebrated historical novel, *De Leeuw van Vlaanderen* (Antw. 1838); but being soon dissatisfied with the small pay and irksome work of the post he had obtained in a government office, he threw up all his avocations, and for a year worked as a gardener. Wappers again befriended him, by inducing the king to give him the place of Registrar at the Royal Academy of Painting at Antwerp, with a small salary; and of late he has also been in the occupation of a well-paid post under government as District Commissary at Courtray. C. has written numerous tales and novels, most of which have been translated into French and German, and some into English—as, for instance, his *Sketches of Flemish Life,* of which several English translations have been made; *Demon of Gold, Lion of Flanders,* &c. Besides the works already mentioned, C. has written two historical novels, *Geschiedenis van Græf Hugo van Craenhove* (Antw. 1845), and *Jakob van Artevelde* (Antw. 1849), which are esteemed among his best; but his *forte* lies rather in the delineation of simple village life, of which his numerous tales and sketches afford ample evidence. His *Illustrated History of Belgium* (Antw. 1845) is interesting as a national work, but of little value as an authority. C. has contributed largely to the revival of Flemish literature, and his works are held in the highest esteem by his countrymen.

**CO'NSCIOUSNESS.** This is perhaps the most comprehensive term employed in designating the mind. If it had been used only in its widest signification, there would have been little difficulty in defining it; but unfortunately there are some exceedingly important meanings of a narrower range that are commonly expressed by it, rendering it an ambiguous or equivocal term, and like all such terms, a source of fallacy and misapprehension.

In the widest meaning, C. is almost identical with mind in action. When we are mentally alive, or performing any of the recognised functions of the mind, we are said to be conscious; while the total cessation of every mental energy is described by the term 'unconsciousness,' among other phrases. In dreamless sleep, in stupor, fainting, and under the influence of the anæsthetic drugs, we are unconscious; in waking, or rallying into renewed mental activity, we are said to become conscious.

As the mind in its waking or active condition may be more or less excited, or vary in the intensity of its manifestations, there are degrees of C.; and, in accordance with a very common usage, the name is apt to be applied to denote the higher degrees in opposition to the lower.

In first learning to write, to cast up sums, or to play on an instrument, our mind is put very much on the stretch; in other words, we are very much excited or highly conscious. When years of incessant practice have consummated the process into a full-formed habit, a very small amount of mental attention is involved; and we may then be said to perform the work all but unconsciously.

We must next advert to the special or restricted meanings of the term, which are those that play the most important part in philosophical discussion. In the first place, we find it applied to denote the mind's cognizance of itself, as opposed to the cognizance or examination of the outer world. Hence, in studying our own minds, we are said to be using C. as the instrument; but in studying minerals or plants, we resort to external observation by the senses. A contrast is thus instituted between C. and observation, which contrast gives to the former word a peculiarly contracted meaning; for in the wide sense above described, observation is truly an act of consciousness.

In the next place, C. is sometimes identified with Belief. We often express a strong affirmation by saying, that we are quite conscious that such a thing is so. It is the strong instinctive tendency of our nature to believe a number of things before we have gone through any large experience of matter of fact. The believing function is a prominent attribute of mental activity. We are scarcely able to feel or act without the operation of belief, or without making assumptions in anticipation of the reality. We believe first, and prove or disprove afterwards. The more intensely we are made conscious, the more strongly we pass into these intuitive convictions. We unhesitatingly believe in the future persistence and universal prevalence of the order of things that we are born into, until such time as our experience gives us a check. Our emotions all produce beliefs in proportion to their strength. Fear makes us believe in coming evil; joy and elation give confidence in coming good. So that it is true to a certain extent, that the state of belief is engendered along with C., and is stronger as that is stronger; but it does not follow, as is frequently maintained, that to be conscious of every affirmation is to verify it, because our C. cannot be presumed to lie. See Common Sense.

Correct usage, therefore, would dictate the employment of the term in question only in the one sense, in which it is co-extensive with being mentally alive, as opposed to sleep, torpor, insensibility, &c. Anything that renders the mental activity more intense, that increases the whirl of the brain (such as strong pleasures and pains, great interest in anything that is going on, &c.) is designated by the positive term C.; the opposite condition, and also the feebler modes of excitement, are expressed by the negative—unconsciousness. All mere special and restricted applications should be forborne, as introducing confusion into thought, and error into philosophy. The study of our own mind may be expressed by such phrases as 'self-consciousness,' 'introspective attention,' and the like. As it is an entire fallacy to talk of C. in general as accrediting doctrines or matters of belief, any acceptation of the word implying this should be avoided.

Points of great importance are involved in the determination of the *conditions* of C., or the circumstances attendant on the manifestation of mental excitement; in other words, the stimulants of our emotional and intellectual wakefulness. The most general and fundamental condition of our becoming conscious, as regards influences external to the mind, is *change*. The even continuance of one impression tends to unconsciousness; and there are a number of facts that shew that if an influence were present in one unvarying degree from the first moment of life to the last, that influence would be to our feeling and knowledge as if it did not exist at all. This important point is more fully illustrated under Conditioned.

In a recently published volume, entitled *Contributions to Mental Philosophy*, by Immanuel Hermann Fichte—the son of the renowned Johann Gottlieb Fichte—translated by Mr Morell, the attempt is made to establish the existence of a Preconscious Mind, distinct from our conscious life, and not dependent like that upon the bodily organisation.

It appears that Fichte considers the power of germination and growth—or that energy, whatever it is, that unfolds the germ and conducts it to a completely formed organisation—as a function of the mind or soul; which is almost to revert to the views of the ancient philosophers, with whom the soul was the 'vital principle,' or the peculiarity that distinguished organised beings from minerals. Aristotle spoke of the soul of plants as well as of animals, or of man. Fichte couples this power of germination with the following things—namely, the instincts; the processes of intelligence that we seem to go through without being aware of the steps, as in the sudden inspirations of men of genius; with all the mysterious phenomena of second-sight, clairvoyance, &c.; and the aggregate of this he erects into a preconscious mind or soul, the contrast of C. as above defined. For the varieties or divisions of our conscious states, see Mind.

**CONSCIOUSNESS,** Double. See Double Consciousness.

**CONSCRI'PTION** is the system whereby the French and some other foreign armies are recruited. It differs essentially from the English system in being compulsory. See British Army.

In France, the system presents itself in the following form. Every Frenchman may be called upon, at the age of 20, to serve his country as a soldier; but the service is open to those who choose to enlist as early as 18. Having satisfied the law of C., he cannot again be called upon to serve. The term is generally for seven years, but may be voluntarily prolonged on certain conditions. The conscript may find a substitute, but is held responsible for him for a space of one year. An account is kept of the number of youths in France who reach the age of 20 in each year; this, during the last few years, has been about 320,000. About one-third are declared exempt on various grounds, but the remaining two-thirds are liable, and out of these the number required for the army is drawn by lot. All those are exempt who are under 5 feet 2 inches in height; or have any natural infirmities unfitting them for active service; or are the eldest of a family of orphans; or are the only sons of widows, or of disabled fathers, or of fathers above 70 years of age; or are intended for the church; or are pupils at certain colleges. Moreover, if two brothers be drawn as conscripts, and the younger is efficient, the elder is declared exempt; and if of two only brothers one is already in the army, or has retired through wounds or infirmity, the other is exempt. Culprits and felons are not allowed to enlist, as they would degrade the military profession. Voluntary enlistment is always very small in France; and hence the system of C. is deemed indispensable.

**CONSECRA'TION** is the act of solemnly dedicating a person or thing to the service of God. It was one of the most widely spread religious ceremonies of the ancient world, being practised in India, Egypt, Chaldæa, Judæa, Greece, Rome, Britain, and other countries. In the Old Testament, we read of the C. or dedication of the first-born, both man and beast, to the Lord; also the dedication of the Levites, of the tabernacle and altar, of fields, houses, walls, &c. This custom, at least so far as regarded places and things, did not pass immediately from Judaism to Christianity, for the latter being more or less a persecuted religion until the time of Constantine, could not venture to indulge with safety in any public ceremonialism; but no sooner was the sword of persecution sheathed than, according to Eusebius, 'the sight was afforded us, so eagerly desired and prayed for by all—the festivals of dedications and consecrations of the newly erected houses of prayer throughout the cities.' Eusebius himself describes the C. of the church built at Jerusalem by Constantine, 335 A. D. The practice of consecrating religious edifices has continued to the present day in the Roman and Anglican churches. The forms were at first very simple, consisting chiefly of prayer, the celebration of the Lord's Supper, thanksgiving, and benediction; but they afterwards became more numerous and imposing, whilst, also, the bishops and higher dignitaries assumed the power of consecrating entirely to themselves. An important part of the C. of Roman Catholic churches consists in the deposition of relics for a time upon the altar. In the English Church, each bishop is left to his own discretion as to the form of C. to be adopted, but that most generally used is the form sent down by the bishops to the lower houses of convocation in 1712. The English Church also retains the C. of burying-grounds.

C. OF ARCHBISHOPS AND BISHOPS.—According to a canon of the first Nicene Council, there must be four, or at least three bishops present at the C. of an archbishop or bishop. The form used in the Church of England is that prepared in the reign of Edward VI. The Romanists deny the validity of English orders generally, as derived from heretical and improperly consecrated bishops. They had an old story, refuted by their own historian Lingard, which is known as that of the 'Nag's Head Consecration.' According to this story, Archbishop Parker was consecrated at the Nag's Head Tavern, Cheapside, by one of the Protestant bishops present laying a Bible on his head, and saying: 'Take thou authority,' &c. Lingard thus relates the facts: 'Barlow, the deprived Bishop of Bath, and Hodgkins, once Suffragan of Bedford, who had both been consecrated according to the Roman Catholic pontifical, in the reign of Henry VIII., and Scorey, the deprived Bishop of Chichester, and Coverdale, the deprived Bishop of Exeter, who had been both consecrated according to the Reformed ordinal, proceeded to confirm the election of Parker, and then to consecrate him after the form adopted in the reign of Edward VI. A few days later, Parker, as archbishop, confirmed the election of Barlow to the see of Chichester, and of Scorey to that of Hereford, and with these for his assistants, consecrated all the other prelates elect.' The C. took place in the chapel at Lambeth, as appears by the archbishop's register, and Lingard says that there is nothing to countenance the supposition of the entry being other than authentic. The story probably arose from a fact, mentioned by Fuller, that the commissioners who confirmed Parker's election dined at the Nag's Head, a tavern much frequented by the country clergy.

CONSECRATION OF THE ELEMENTS. See LORD'S SUPPER.

**CONSE'CUTIVE**, a term in Music, applied to octaves and fifths, which, according to the rules of harmony, are strictly forbidden.

**CONSEGUIANA**, a volcano of Nicaragua, occupies a promontory on the south side of Fonseca Gulf, about ten miles distant from the Pacific Ocean. The crater, at an elevation of about 4000 feet above the mean level of the surrounding country, is about half a mile across, while its interior descends perpendicularly to a depth of 200 feet. In 1835, a fearful eruption, the last on record, converted into a waste a large tract of grazing-land.

**CONSE'NT.** When we state that C. is the foundation of all contracts and legal obligations of every kind, we state a proposition often in the mouths of lawyers, but the vast magnitude and importance of which is by no means always apparent even to them. The doctrine that the free C. of the parties bound, and not the will of any earthly legislator, or the form in which that will is expressed, constitutes the binding element in contracts, flows as an inevitable logical consequence from the doctrines of personal and political freedom. And yet we continually forget it, and not only speak but act at variance with it. We talk of persons being married by the priest, and divorced by the proctor, whereas it is obvious that a valid marriage, like every other contract, can be made and unmade only by the contracting parties; and that all that either civil or ecclesiastical authority can do, is to ascertain, at the instance of one or other of them, whether it *has* been made or unmade. From overlooking this point of view, differences between legal systems, which are merely external, are often supposed to be fundamental. The law of Scotland, which admits several ways of proving matrimonial C. which the law of England rejects, is on this account supposed to differ from it *in principle.* The only question between them, in reality, is, as to whether the circumstances which the law of Scotland admits in proof of the existence of C. do or do not prove it in point of fact. If it be true that the only means by which it can be ascertained that two persons do agree to be man and wife, is by their declaring their agreement either before a clergyman or before a parliamentary registrar, then the law of England does right in rejecting all other evidence. If, on the contrary, the fact can be established, as is believed in Scotland, by other means, such as a declaration before witnesses, or an exchange of writings, then the law of Scotland is right in admitting these means of proving it, and making the question of marriage or no-marriage, as it does, one of simple proof. The difference between the two systems is thus seen to be not one of principle, but one of expediency—a question, not in the law of marriage, or of contracts, which is the same in both countries, and in every country, but in the law of evidence.

Yet so strangely illogical are mankind, that in Scotland it is still asked whether or not a marriage can be constituted, in certain circumstances, without a declarator of the Court of Session; and in England, until very recently, no marriage could be dissolved without an act of parliament. The practical question as to how C. shall be proved, is one surrounded at all times with the greatest difficulty. That its absence may be assumed in the case of all persons of imperfect understanding, and, consequently, that the power of contracting should be denied to idiots, madmen, and pupils, helps us but a very small way. The real difficulty consists in distinguishing, in the case of grown and sane men, between such *real* C. as may be safely assumed to be a deliberate act of the reason, taking that word in its widest sense, and such *apparent* C. as may have had its motive in caprice, passion, ignorance, or any temporary and accidental aberration of mind.

**CONSERVA'TION OF FORCE.** See FORCE.

**CONSE'RVATIVE.** See WHIGS AND TORIES.

**CONSERVATOIRE,** or **CONSERVATO'RIUM** (Ital. *conservatorio*), a name given by the Italians to schools instituted for the purpose of advancing the study of music and maintaining its purity. In the earliest times, these schools were partly attached to benevolent institutions and hospitals; others, again, were supported by opulent private individuals. They were originally intended for foundlings, orphans, and the children of poor parents. Some trace their origin to St Ambrose, Bishop of Milan, in the 4th c., or St Leo, who flourished in the 5th. The scholars, male and female, all received free board, lodging, clothing, and were taught to sing and play. Extra boarders were also admitted on paying a fee. In Naples, there were at one time three such schools, while in Venice there were four, expressly for females. In 1818, the Neapolitan conservatoires were reduced to one, under the name of Real Collegio di Musica. The Venetian conservatoires shared in the downfall of the Venetian republic. A new grand C. was founded at Milan in 1808, which still exists. In France, the necessity of a school for educating singers gave rise to the *Ecole Royale de Chant et de Déclamation*, in 1784. During the French Revolution, in consequence of the scarcity of instrumental musicians for the army, the government decreed the erection of an Institut National de Musique, in 1793, which was changed into the present establishment in 1795 under the name of the C. de Musique. The yearly expenses of this C. were fixed at 240,000 francs, the number of masters was 115, and the pupils of both sexes amounted to 600. In 1802, the expense was reduced to 140,000 francs, with a corresponding reduction in the number of masters and pupils. The course of study is divided over 66 different classes, in which all appertaining to music and also declamation is taught by the best masters. The elementary works published by this C. for all instruments are known over the whole world. Next to the conservatoires of Italy and France come those of Warsaw, Prague, Brussels, and Vienna, which last was established in 1816. In 1842, a C. was established in Leipsic, under the auspices of Mendelssohn, which is reckoned the most important in Germany at the present day. In Cologne a similar C. was founded in 1849.

**CONSERVA'TOR OF THE STAPLE.** See CAMPVERE.

**CONSERVATORS OF THE PEACE.** The sovereign, by virtue of his office, is the principal conservator of the peace within these realms. The function which he thus possesses he may delegate, thus constituting a subject a conservator of the peace. The office, however, must always be exercised in the sovereign's name, and it is for this reason that we always speak of the king's or of the queen's peace. Several high officers of the crown, the Chancellor or Keeper, the Lord High Steward, the Lord Marshal, and the Lord High Constable, when there are such officers, all the justices of the Queen's Bench, the Master of the Rolls, are C. of the P. throughout the whole kingdom, and may commit breakers of the peace or bind them in cognizances anywhere. Other judges possess this power only within the limits of their own jurisdiction. The sheriff and coroner are C. of the P. within their respective counties, and constables, tithing-men, &c., within their jurisdictions. But in addition to these official conservators, others were appointed expressly for the purpose, previous to the appointment of justices of the peace, in the reign of Edward III. Their powers were far inferior to those of the justices, being confined exclusively to the function which the name indicates. The lords of manors frequently possessed the powers of conservators within their manors by prescription, and it was not unusual for lands to be held on the tenure of discharging the duties of a conservator of the peace within the county. Lastly, conservators were appointed by letters-patent from the crown in cases of emergency for the preservation of the peace in particular districts. All these different kinds of conservators, with the exception of these judges and others who are conservators *ex officio*, were superseded by the appointment of Justices of the Peace (q. v.).

**CONSE'RVATORY,** in Horticulture, a house for the cultivation of tender exotic plants, which, although requiring protection from frosts, and a little assistance of artificial heat, do not need the heat of the hothouse or stove. The only distinction between a C. and a green-house is, that in the former the plants grow in borders of earth; in the latter, they are in pots, and these two characters are often combined. The structure, management, &c., are much the same for the C. as for the green-house; but in the warmer parts of the country, the roof and even the sides are with advantage made capable of being removed in summer. In all situations, the most free and frequent ventilation is requisite. A C. is often attached to a mansion, instead of being placed in the garden. See *Conservatories and Hothouses*, by R. S. Burn, published by W. and R. Chambers.

**CO'NSERVES** are described by Cooley in his *Cyclopædia of Practical Receipts*, to be 'recent vegetable matter, as flowers, herbs, roots, fruit, and seed, beaten with powdered sugar to the consistence of a stiff paste, so as to preserve them as nearly as possible in their natural freshness.' C. are made by druggists as vehicles for more active medicines, and by confectioners as sweetmeats.

**CONSIDÉRANT,** VICTOR-PROSPER, a French Socialist, was born in 1805 at Salins, in the department of Jura. After being educated at the Polytechnic School of Paris, he entered the army, which, however, he soon left to promulgate the doctrines of Fourier (q. v.). After the death of his master, C. became the head of the Societarians, and undertook the management of *The Phalanx*, a review devoted to the maintenance and spread of their opinions.

Having gained the support of a young Englishman, Mr Young, who advanced the required sum of money, C. established, 1832, on a large estate in the department Eure et Loire, a Socialist colony or *Phalanstère;* but the experiment failed, and with it *The Phalanx* fell to the ground. However, a new organ of co-operative doctrine, the *Démocratie Pacifique*, was soon established, and was edited by C., who displayed great zeal, perseverance, and ability, in his hopeless battle with the laws of society as now constituted. Among his numerous writings, the chief is the *Destinée Sociale*, dedicated to Louis Philippe. In 1849, C. was accused of high treason, and compelled to escape into Belgium, whence he emigrated to Texas, returned to Brussels, and again emigrated to Texas, where he founded a Societarian community, called *La Réunion*, which as late as 1856 was in a flourishing condition. See COMMUNISM.

**CONSIDERA'TION**, in Law, the thing given, or done, or the forbearing or suffering something as recompense to another, for doing, giving, forbearing, or suffering. An obligation incurred without C. is, in England, termed voluntary, in Scotland gratuitous; if for C., it is so styled in England, but in Scotland it is called onerous. Considerations are divided in England into good and valuable, the former being affection for a near relative, the latter a pecuniary or other tangible benefit, or marriage. There is no corresponding division in Scotland. But in Scotland, on the other hand, there is, as a general rule, no need for the intervention of a C. to make a contract valid, while in England a contract without C. is invalid, unless it be evidenced by formal deed (q. v.). In this respect, the law of England is founded upon the maxim of the civil law, *ex nudo pacto non oritur actio;* while the Scottish rule is founded on that of the canon law, *omne verbum de ore fideli cadit in debitum.* But the C. which in England is sufficient to support a contract, may be of the most illusory kind. Thus, an agreement to take less than the full sum in payment of a debt is without C. and invalid, even though the sum stipulated be paid, because there is no C. to support the agreement to give up the residue; but if the agreement was to take a stick of sealing-wax instead of the money, it is an agreement for valuable C. and binding, and the transfer of the wax extinguishes the debt.

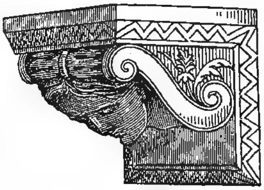
There are some circumstances which, in both countries, warrant the setting aside of obligations without C., whether made by deed or not. In England, they are void as against *bona fide* purchasers, by 27 Eliz. c. 4; and void as against creditors where the grantor is indebted to such creditors at the time to the extent of insolvency, by 13 Eliz. c. 5. A similar rule to the latter is established in Scotland by the act 1696, c. 5, and without proof of insolvency when the deed is granted to a near relation, or a person in a confidential situation, by 1621 c. 18. And all obligations for which the C. is illegal or immoral, are in both countries void.

**CONSI'GNMENT**, in Mercantile Law, is the term applied to goods which are placed in the hands of an agent or factor, for sale, or for some other specified purpose. Where either the consigner or consignee becomes bankrupt, questions of nicety often arise regarding ownership, and the consequent rights of the parties and their creditors.

**CONSI'STORY** (Lat. *consistorium*), properly, a place of assembly, but in the later Latinity the word came to signify the particular place where the privy-council or cabinet of the Roman emperor met, and after the time of Diocletian and Constantine, the council itself. The assessors of this council were partly the ordinary members (*comites consistoriani*), such as the imperial chancellor and seneschal, partly extraordinary; and their duty was to deliberate on all the important affairs of legislation, administration, and justice. The *form* of the imperial C. passed over into the early Christian Church. The bishops established their consistories; and the highest ecclesiastical court, composed only of cardinals (the College of Cardinals), which meets in the Vatican, under the presidency of the pope, to determine all such matters as the appointment of cardinals, archbishops, bishops, &c., still bears this name, as do also the private councils which the pope can call at his pleasure. The Protestant Church of Germany was induced to perpetuate the consistorial courts principally because the episcopal authority passed into the hands of territorial princes (Ger. *Landesfürsten*) not familiar with ecclesiastical affairs. The first Lutheran C. was established at Wittenberg in 1542. After 1555, when the peace of Augsburg secured the recognition of the Protestant religion, similar consistories were gradually formed in other places. The Lutheran consistories exercise a supervision and discipline over religion and education, over the clergy and the schoolmasters, and examine the theological candidates on their trials for licence and ordination. They have the regulation of divine worship, the administration of church property, and at an earlier period, possessed a certain jurisdiction in regard to marriage.—In the French Protestant churches, the C. possesses a more restricted jurisdiction than in Germany. It exercises authority over a *circonscription*, i. e., a division of the church containing 6000 souls, and is composed of all the pastors of the *circonscription*, together with from 6 to 12 lay-elders elected by a certain number of the people. In that portion of the French Protestant Church which has adopted the Augsburg Confession, the authority of the French monarch is more recognised than in the Reformed Church, for it has a *consistoire général*, composed of delegates, lay and clerical, of the various *circonscriptions*, the president of which is a layman nominated by the emperor.—In England, the word is used to denote the court Christian or spiritual court. Every archbishop and bishop has a consistorial court, held either in his cathedral or other convenient place, before his chancellor or commissary, for ecclesiastical causes. In Scotland, the consistorial courts have lapsed into the commissary-courts. See COMMISSARY.

**CONSOLA'TO DEL MA'RÉ.** See COMMERCIAL LAW.

**CO'NSOLE** (Fr.), in Architecture, a projection resembling a bracket, frequently in the form of the letter S, used to support cornices, or for placing busts, vases, or figures on. Consoles were often richly ornamented in the under part. The illustration, from Parker's *Glossary*, which is from the palace of Diocletian at Spalatro, belongs to the debased Roman style, and exhibits the zigzag or chevron decoration, which passed from that style into the Romanic architecture of the continent, and into the Saxon and Norman of England. See BRACKET, CANTALIVER.



Console.

**CONSOLIDA'TION ACTS.** In order to secure uniformity in acts of parliament having reference to public undertakings, and to avoid the necessity of repeating, in each special act, the clauses usually introduced into such acts, the device has been adopted of consolidating or combining all these provisions in one act having reference to the particular kind of undertaking. Of general acts of this nature the most important are, The Companies' Clauses Consolidation Act, 1845 (8 and 9 Vict. c. 16); The Lands' Clauses Consolidation Act, 1845 (8 and 9 Vict. c. 18), amended as to Ireland (14 and 15 Vict. c. 70); and The Railways' Clauses Consolidation Act, 1845 (8 and 9 Vict. c. 20).

**CO'NSOLS**, a contraction of Consolidated annuities. In incurring the national debt, government borrowed money at different periods on special conditions, being generally the payment of an annuity of so much per cent. on the sum borrowed. Great confusion arose from the variety of stocks thus created, and it was thought expedient to strike an average of their value, and consolidate them into one fund, kept in one account at the Bank of England. The Consolidated Annuities' Act was passed in 1757.

**CO'NSONANCE**, in Music, a term applied to combinations of sounds, whose vibrations when heard together so satisfy the ear that no other sound is wished for, or expected to follow. The more or less satisfying effect of C. depends on the greater or less simplicity of the interval formed by the combined sounds. Intervals whose relative vibrations can be expressed by numbers from 1 to 6, are considered consonant; while those which can only be expressed by the higher numbers, not a duplication of the lower, as 7, 9, 11, 13, &c., are called dissonant. Sounds vibrating as 1 : 1, are unison; as 1 : 2, produce the octave; as 2 : 3, the fifth, which inverted becomes 3 : 4, the fourth; as 4 : 5, the major third, which inverted becomes 5 : 8, the minor sixth; and 5 : 6, the minor third, which inverted becomes 6 : 10, or 3 : 5, the major sixth. Consonant intervals are therefore the third, fourth, fifth, sixth, and octave; from which it follows that there is only one consonant fundamental chord in music, viz., the common chord, or *trias harmonica perfecta*, being a bass note with its third, fifth, and octave, which inverted produces the chords of the 6th and the $\frac{6}{4}$. See CHORD. The ancient Greeks admitted of still fewer consonances in their system of music, as they treated the third and sixth as dissonances; a proof that their system of harmony was not the same as ours. Their name for C. was Symphony, and for dissonance, Diaphony. Early in the middle ages, only the octave, fifth, and third were treated as consonances. Franco of Cologne was the first who divided C. into perfect, semi-perfect, and imperfect. In the writings of Marchettus, and of Joannes de Muris, in the first half of the 14th c., we find already the important rule, that two perfect consonances following in similar progression are not allowable. The study of the C. was carried still further in the 16th c. by Zerlino, who ascertained the true mathematical proportions of the major and minor thirds. Notwithstanding this, Palestrina, up to the end of the same century, and long after him, all who wrote in the same style, carefully avoided the use of the third in the final chord, finishing always with the perfect consonances according to Franco. Of late years, the importance of the C. has attracted the attention of many eminent theorists in music, as well as philosophical writers of undoubted judgment, some of whom do not hesitate to consider the interval of the seventh a C., because it differs from other dissonances in not requiring preparation. There cannot be a doubt that the chord of the seventh, C, E, G, and B flat, considered individually, and not in connection with other chords, is as euphonious and satisfying as the common chord; and when these intervals are placed at the distance from the fundamental note they harmonically arise at, the consonant nature of the combination is still more obvious. A scientific organ-builder in Scotland has long been in the practice of introducing the seventh as an interval in his mixture stops, forming with the fundamental stops a union of sound decidedly consonant, and producing a remarkably brilliant effect. The exact limit of C., or the point where dissonance begins, seems not definitely fixed, if fixed it can be. To define C. to be agreeable sounds, and dissonance to be the reverse, as some do, is clearly absurd, because they both essentially belong to harmony or concord, or as the Germans more properly call it, *Die Kunst des Wohlklangs*, in which there can be nothing absolutely discordant.

A perfect C. causes a musical effect known as Tartini's Grave Harmonic, it having been first observed by the eminent violinist of that name. Along with any two musical notes sounded continuously, there may be heard (if the notes are in accord) a third deeper tone, caused by that number of vibrations which is the greatest common measure of the numbers producing the primary notes, and upon this Tartini founded his theory of harmony (now obsolete), by assuming that the grave note is the natural base of the chord producing it. The note thus sounded may be too deep to be appreciated by the uneducated ear, although felt as a succession of beats, and these should not be confounded with the 'beats' resulting from the sound of a discordant interval, a species of jar or flutter known to tuners as the consequence of the *imperfection* of a consonance. The subject is treated at length by Professor de Morgan in a paper published in the Transactions of the Cambridge Philosophical Society, 1858.

**CO'NSONANT.** See LETTERS.

**CO'NSORT**, literally, one who throws in his lot with another. In English constitutional law, the term is applied to the husband or wife of the reigning sovereign, viewed not in a private but a public capacity, as participating to a certain limited extent in the prerogatives of sovereignty. The extent of these prerogatives in the case of a queen-C. are stated by Blackstone. She is, he says, a public person, exempt and distinct from the king, and 'not, like other married women, so closely connected, as to have lost all legal or separate existence so long as the marriage continues.' For this, Sir Edward Coke gives the curious reason, that 'the wisdom of the common law would not have the king (whose continual care and study is for the public, and *circa ardua regni*) to be troubled and disquieted on account of his wife's domestic affairs.' In addition to this peculiarity in her domestic position, the queen-C. enjoys several exemptions and minute prerogatives. She pays no toll, and is not liable to amercement in any court. But where no such exemption is expressly recognised by law in favour of the royal C., she is on a footing of equality with other subjects, and the privileges which the title conveys are chiefly those of precedence, and belong to court etiquette. Up to the year 1857, the husband of Queen Victoria possessed no distinctive English title, and no place in court ceremonial except such as was conceded to him by courtesy. In that year, the title of Prince-C. was conferred upon him by letters-patent.

**CONSPI'RACY**, a combination between two or more persons to perpetrate an unlawful act, is called a conspiracy. See COMBINATION.

**CONSPIRACY BILL.** In consequence of an attempt to assassinate the Emperor and Empress of the French whilst going to the opera on the evening of the 14th January 1858, by the Italian refugee Orsini and others, by means of explosive shells partly manufactured in England, a bill was introduced into parliament by Lord Palmerston, declaring conspiracy to murder, which the law of England had hitherto treated as a misdemeanour, to be a felony, punishable with penal servitude, and applying that provision to all persons whether English or foreign, and to all conspiracies to murder whereever intended. In place of being regarded merely as a piece of law reform, the C. B. obtained a political character partly from a dispatch from the French minister, Count Walewski, demanding some such change in our law, and partly from expressions contained in certain addresses which were presented to the Emperor by the French army, and published in the government organ, the *Moniteur*, which were regarded as insulting to England. The ministry were accused of truckling to France; and though on the motion for leave to bring in the bill they had a majority of 200 (299 against 99), an amendment by Mr M. Gibson on the second reading, virtually amounting to a vote of censure, was carried by a majority of 19 against them (234 to 215).

**CO'NSTABLE** (Lat. *constabulus*). Whether this officer was called originally *comes stabuli*, the count of the stable or master of the horse (as alleged by Ducange), or the *koning-stapel*, staff and stay of the king (as Coke, Selden, and others, with less reason, have maintained), the C., both in France and England, was a military personage of the very highest rank. The C. of France rose gradually in importance from the comparatively modest position of an officer of the household, till at last he became, *ex officio*, the commander-in-chief of the army in the absence of the monarch, the highest judge in military offences and in all questions of chivalry and honour, and the supreme regulator and arbitrator in all matters connected with tilts, tournaments, and all martial displays. The office of C. is traced back by Anselme to Alberic, who held it in 1060; but the first C. of France who appeared at the head of an army was Mathew, the second Seigneur de Montmorency. The office was suppressed by Louis XIII. in 1626. Among the offices of the ancient monarchy which were restored by Napoleon for mere purposes of state, that of C. was one. His brother, Prince Louis Napoleon, afterwards king of Holland, was created Grand C., the Vice-C. being Marshal Berthier. The office was again abolished on the restoration of the Bourbons, and has not since been re-established. But besides the C. of France, almost all the great vassals of the crown had constables who filled analogous offices at their minor courts. There were constables of Burgundy, of Champagne, and of Normandy; the latter of whom may be regarded as the progenitor of the C. of England.

Shortly after the Conquest, a Lord High C. of England appears, with powers and privileges closely corresponding to those of the C. of France (13 Rich. II. st. 1. c. 2). His position as judge of the court of chivalry, in conjunction with the Earl Mareschal, and the limitation of his power, which followed on the statute 13 Rich. II. c. 2, are explained under CHIVALRY, COURT OF. The office was abolished by Henry VIII. on the attainder of Edward Stafford, Duke of Buckingham; and a Lord High C. is now appointed only on the occurrence of great state ceremonies, e. g., a coronation. The High C. of Scotland was an officer very similar to the C. of France and England. After the Rebellion, the offices of the inferior constables dependent on the High C., such as the C. of the Castle (q. v.), were abolished, but that of the High C. himself was expressly exempted, and still exists in the noble family of Errol. The privileges attaching to this office are now entirely honorary; but in virtue of it, the Earl of Errol is said to be the first subject in Scotland after the blood-royal; and on the occasion of the visit of King George IV. to Edinburgh, the then earl was allowed to take precedence of the possessors of all other hereditary honours. The present Earl of Errol is the 22d High C. of Scotland.

CONSTABLE OF A CASTLE was the keeper or governor of a castle belonging to the king or to a great baron. These offices were frequently hereditary; thus there were constables or hereditary-keepers of the Tower, and of the Castles of Dover, Windsor, &c.—CONSTABLE OF THE HUNDRED, and CONSTABLE OF THE VILL, were the predecessors of the high and petty constables of later times. The statute of Winchester (13 Ed. I. st. 2, c. 6), by which the office of high constable is usually, though probably not correctly, said to have been first introduced, ordains that in every hundred or franchise there shall be chosen two constables, to make the view of armour, and to see to the conservation of the peace. The petty constable exercised similar functions within the narrower limits of the township or parish, and was subordinate to the high constable of the hundred. The high constables are appointed by the courts leet of the franchise or hundred over which they preside; or, in default of such appointment (7 and 8 Vic. c. 33, s. 8), by the justices at their special sessions. The appointment of petty constables is by 5 and 6 Vict. c. 109, and 13 and 14 Vict. c. 20, given to justices, who are directed annually to require from the overseers of parishes a list of those within the parish qualified and liable to serve as constables. When not specially exempted, every able-bodied man, between 25 and 55 years of age, resident in the parish, and rated to the poor or a tenant to the value of £4 per annum, must be included in this list. These lists are to be revised by the justices, who shall choose therefrom such number of persons as they deem requisite. No person who has served shall be liable to serve again till all the others are exhausted. Certain penalties are imposed by the act on those who shall refuse to serve, and an oath of office is prescribed. This act entirely supersedes the ancient method of appointing petty constables. —SPECIAL CONSTABLES are persons sworn in by the justices to preserve the peace, or to execute warrants on special occasions. By 1 and 2 Will. IV. c. 41, and 5 and 6 Will. IV. c. 43, any two justices of the peace who shall learn, on the oath of a credible witness, that a tumult, riot, or felony has taken place, or is apprehended, may, if they are of opinion that the ordinary officers are insufficient, swear in as many householders or others as they may think fit (not belonging to the classes of persons exempted from the duties of ordinary petty constables) to act as special constables for a limited time or for a particular place. The lord-lieutenant may also, by direction of one of the principal secretaries of state, cause special constables to be appointed for the whole county, or any part of it, in which case exemptions may be disallowed. For county constabulary, see POLICE, COUNTY.

**CO'NSTANCE**, LAKE (called by the Germans *Bodensee* or *Bodmansee*, from the old castle of Bodman—the *Lacus Brigantinus* of the Romans), lies on the north side of the Alps of Switzerland, and forms a meeting-point of the five territories —Baden, Würtemberg, Bavaria, the Tyrol, and Switzerland. It has an elevation variously estimated at from 1250 feet to 1385 feet above the sea. Lake C. is traversed by the Rhine from east to west; its greatest length is about 44 miles, utmost breadth 9 miles, and depth 964 feet. It is divided into the upper and lower lakes, the latter of which extends from Constance to Stein. Anciently, the lake was more extensive toward the south than now. In the 4th c., it is said to have extended as far as Rheineck, now some miles distant from the shore. The shores are formed by hilly lands, with low tracts at the mouths of the Rhine and smaller rivers. Cornfields, vineyards, pastures, orchards, and wooded declivities, with here and there the ruins of old castles interspersed, surround the lake. The water has a dark-green hue, often rises suddenly some ten or twelve feet during a thaw, and rolls in high waves during the prevalence of a strong south, north-west, or east wind. Without visible cause, it sometimes rises and falls to a considerable degree. In one hour, in 1770, it rose between 20 and 24 feet above the ordinary level. It is seldom frozen, except in very severe winters. The lake contains sixty kinds of aquatic fowl; twenty-five species of fish, including fine salmon, and salmon-trout; and several species of shell-fish. Since 1824, steam-navigation has added to the facilities of commerce across the lake, and its commercial importance has been greatly increased by the opening of a railway from Friedrichshafen, by Ulm and Stuttgart, to Heilbronn.

**CONSTANCE**, a city in the grand duchy of Baden, formerly a free city of the German empire, situated on the Lake of Constance, at the place where the Rhine connects by a very short course the upper and lower lakes together. C. is one of the most ancient towns in Germany, but it is very much decayed, its population, once 40,000, being now not more than 5000 or 6000. Its cathedral was erected in the 11th century. C. is notable in history for the ecclesiastical council held in 1414—1418. The object of the Council of C. was to put an end to the disorders in the popedom and in the election of popes, and also to prevent the spread of the doctrines of Huss. There assembled, with the Emperor Sigismund and Pope John XXIII., 26 princes, 140 counts, more than 20 cardinals, 7 patriarchs, 20 archbishops, 91 bishops, 600 prelates and doctors, and about 4000 priests. The three rival popes, John XXIII., Gregory XII., and Benedict XIII., were deposed, and Martin V. was elected. Huss and Jerome of Prague were condemned and burned. The emperor was disappointed in his hope of a thorough ecclesiastical reform, and the Council of Basel was afterwards called to carry on the work which the Council of C. had failed to accomplish. The hall in which the council met is now the market-hall of Constance. C. has manufactures of silk, cotton, and watches, active fisheries, and the cultivation of vineyards and gardens employs a considerable number of the inhabitants.

**CO'NSTANT** is the name given, in mathematical analysis, to a quantity which remains the same for all cases of the problem, in opposition to a variable. Thus, in questions about the fall of bodies in given times, the force of gravity is a constant quantity. In the integral calculus, the name of constants is given to those quantities which, after integration, are annexed to the integral.

**CONSTANT DE REBEQUE**, Henri Benjamin, one of the most distinguished political writers and orators of France, was born at Lausanne on the 25th October 1767. Educated in a German college, he afterwards spent some time at Edinburgh University, and here he is supposed to have imbibed those ideas of political freedom which guided him through life. In 1796, he published in Paris a pamphlet on the government then existing, which brought him into note; and three years later, he was placed on the 'Tribunat' by Napoleon, who, however, two years after, dismissed and banished him for the spirit he displayed in resisting the First Consul's encroachments on liberty. During his banishment, he travelled for some time with Madame de Staël, and afterwards settled in Germany. In 1813, he published his celebrated pamphlet, *On the Spirit of Conquest and Usurpation.* In 1814 he returned to Paris, where he wrote several pamphlets in favour of constitutional liberty, which he maintained was enjoyed under Louis XVIII. Napoleon's government he described as a 'government of Mamelukes,' and the emperor himself as 'a Genghis Khan.' Yet during the Hundred Days he became a councillor of state, and assisted in framing the *Acte Additionnel.* In 1819, he was elected a deputy, became ultimately leader of the opposition, and in this capacity gained unbounded popularity. C. de R. was a true patriot. He loved liberty better than monarchies or mobs, and therefore, while he opposed the despotic measures of the government of Charles X., he deplored the revolution of July 1830. He died December 1830. As a public speaker, C. de R. was in his day the clearest and most persuasive advocate of constitutional principles in France. As a political writer, he was even fully more effective than as a speaker. Among his works may be mentioned, *Discours Prononcés à la Chambre des Deputés* (2 vols., Par. 1828), the *Cours de Politique Constitutionnelle* (4 vols., Par. 1817—1820, 2d ed. 1833), in which are collected his minor works on representative government. Among his most ambitious works are *Mémoires sur les Cent Jours* (Par. 1820), *De la Religion considérée dans sa Source, ses Formes, et ses Développements* (5 vols., Par. 1824—1831), to which posthumous work his *Du Polythéisme Romain, consideré dans ses Rapports avec la Philosophie Grecque et la Religion Chrètienne,* forms a kind of supplement.

**CONSTA'NTIA**, a district of Cape Colony, in South Africa, lying on the eastern and north-eastern slopes of Table Mountain range, and distant from Cape Town about 12 miles. C. consists of only two estates, Great Constantia and Little Constantia, which have long been famed for the quality of the wines produced upon them. Many attempts have been made in other parts of Cape Colony, as also in France and the south of Europe, to produce a wine similar in quality and flavour to the C., but all have failed; and it is now known that not only to the quality of the C. grape, but also to the character of the soil, as well as to the peculiarly genial exposure of the district, the characteristic excellence of the C. (proper) wines is traceable. The soil of the estates is rich in alkalies to an extent perceptible in the grape itself, and the vineyards have a very equable exposure, being sheltered from all sudden changes of temperature by spurs of the great granite mountain. The grapes under this shelter ripen very uniformly, so that the earthy taste, which spoils the character of other Cape wines, and which is produced by using unpicked grapes of different degrees of ripeness in the same bunch, does not attach to the C. wines.

Although the attempts made on other farms in the colony to produce wine similar to that of C., have failed in so far as the peculiar flavour as well as lusciousness of real C. are concerned, yet they have led of late to great improvements in the quality of several of the South African wines; and where care continues to be bestowed, and the habits of different vines in relation to soil and exposure are more studied, we have evidence in the quality of the improved 'Pontac,' and other wines of Wynberg, of what is to be accomplished with increased labour by Cape Colony as a wine-producing country. Statistics of the wine-trade of this settlement shew also that not only in quality but in quantity great and steady advancement is being made—the exports of South African wine for 1860 being in round numbers about 700,000 gallons, nearly three times as much as for 1850. C. supplies about 3000 gallons.

**CONSTANTI'NA**, a town of Spain, in Andalusia, situated in a mountainous district, about 40 miles north-north-east of Seville, to which city it supplies much fruit and ice. It has manufactures of leather and soap, distilleries, flour-mills, &c. Pop. 7000.

**CONSTANTI'NE**, the capital of a province of the same name (the easternmost province of the French colony of Algeria), is situated on a hill with flat summit, three sides of which are washed by the Rummel, flowing through a deep and narrow ravine, and the fourth is connected by a natural mound with the surrounding mountains. Lat. 36° 22′ N., long. 6° 37′ E. It is 830 feet above the river, and 2162 feet above the sea. It is surrounded by walls constructed by the Arabs out of Roman sculptured stones, and a fine old Roman bridge spans the ravine on one side. The streets, as in the other towns of Barbary, are very narrow and dirty, and the houses mean. An old church in the Byzantine style is included in the citadel. C. was anciently one of the most important towns of Numidia, called *Carta* by the Carthaginians, *Cirta* by the Romans, and was long a royal residence. It was destroyed in the wars of Maxentius against Alexander about 311 A.D., but was soon rebuilt by Constantine the Great, from whom it derives its present name, and continued to subsist, and was a flourishing town in the 12th century. Subsequently, it shared in general the fortunes of Algeria (q. v.). C. has manufactures of woollen cloths, saddlery, and other articles of leather. Population about 24,000, of whom some 2000 are Europeans.

**CO'NSTANTINE I.**, Flavius Valerius Aurelius, surnamed 'the Great,' a Roman emperor, was born 272 or 274 A.D., at Naissus, in Mœsia. He was the eldest son of Constantius Chlorus, and first distinguished himself by his military talents under Diocletian, in that monarch's famous Egyptian expedition, 296; subsequently he served under Galerius in the Persian war. In 305, the two emperors, Diocletian and Maximian, abdicated, and were succeeded by Constantius Chlorus and Galerius. Galerius, who could not endure the brilliant and energetic genius of C., took every means of exposing him to danger, and it is believed that this was the period when he acquired that mixture of reserve, cunning, and wisdom, which was so conspicuous in his conduct in after-years. At last C. fled to his father, who ruled in the West, and joined him at Boulogne just as he was setting out on an expedition against the Picts in North Britain. Constantius died at York, July 25, 306, having proclaimed his son C. his successor. The latter now wrote a conciliatory letter to Galerius, and requested to be acknowledged as Augustus. Galerius did not dare to quarrel with C., yet he granted him the title of Cæsar only. Political complications now increased, and in a short time no less than six emperors were 'in the field'—viz., Galerius, Licinius, and Maximin in the East, and Maximian, Maxentius his son, and Constantine in the West, 308 A.D. Maxentius having quarrelled with his father, forced him to flee from Rome; he took refuge with C., but was ungrateful enough to plot the destruction of his benefactor. This being discovered, he fled to Marseille, the inhabitants of which city gave him up to C., who put him to death, 309 A.D. Maxentius professed great anger at the death of his father, and assembled a large army, with which he threatened Gaul. Crossing the Alps by Mont Cénis, C. thrice defeated Maxentius—first near Turin, then under the walls of Verona, and finally in the vicinity of Rome, 28th October 312, Maxentius himself in the last of these engagements being drowned in an attempt to escape across the Tiber. C. now entered the capital, disbanded the Prætorians, and adopted other judicious measures for allaying the public excitement. He was also honoured with the title of *Pontifex Maximus*, or Supreme Dignitary of the Pagan Hierarchy.

C. was now sole emperor of the West. Similarly, by the death of Galerius in 311, and of Maximin in 313, Licinius became sole emperor of the East. In 314, a war broke out between the two rulers, in which Licinius had the worst, and was fain to conclude a peace by the cession of Illyricum, Pannonia, and Greece. C. gave Licinius his sister Constantina in marriage, and for the next nine years devoted himself vigorously to the correction of abuses in the administration of the laws, to the strengthening of the frontiers of his empire, and to the chastising the barbarians, who learned to fear and respect his power. In 323, he renewed the war with Licinius, whom he defeated, and ultimately put to death. C. was now at the summit of his ambition, the sole governor of the Roman world. He chose Byzantium for his capital, and in 330 solemnly inaugurated it as the seat of government, under the name of Constantinople or City of Constantine. In 324, he committed a deed that has thrown a dark shade over his memory. He had a gallant and accomplished son, named Crispus, who was exceedingly popular, and him, along with Constantina and others, he put to death on a charge of treason. Niebuhr shews that it was not unlikely Crispus cherished ambitious designs. Next year occurred the great Council of Nice. C. sided with the orthodox fathers, probably for very heterodox reasons. As yet he was a pagan, but his sense of justice, and his conviction of the growing importance of the Christians, both as a moral and political element in the life of the empire, had from the very first induced him to protect them. As early as 313 he had everywhere granted them toleration, and since then continued to favour them more and more decidedly. As president of the Nicene Council, he opposed the Arians, on political grounds, as the weaker party; but not being theologically interested in the dissensions, he refrained from active persecution. During the latter years of his life, Christianity became the state-religion, the pagan temples were closed, and sacrifices forbidden. Yet it was only a short time before his death, which occurred 22d July 337, that he would allow himself to be baptized.

The question has been much discussed, whether or not C. was a Christian. The truth seems to be, that he looked upon religion as a *statesman*, who feels that his first duty is to rule the nation over which he is set in an orderly and peaceable manner. Had paganism been still in its prime, and possessed any real political vitality, it is not likely that a man of C.'s secular temperament would have troubled himself in regard to the new faith; but when he found that the latter was making rapid progress in spite of the fiercest persecution, he must have felt it wisest, and probably also conceived it *right*, to protect and favour it. But he continued to the last addicted to many pagan superstitions. As an emperor, however, he ranks very high. He was beloved by his people, for whose welfare he seems to have honestly laboured. Severe and even sanguinary towards individuals, he was just and moderate towards nations. He conquered every enemy, organised a new and better mode of government for his vast dominions, crushed all conspiracies and revolts, and passed the close of his life in peace.

**CONSTANTINE**, Paulowitch, a Russian grand-duke, born 8th May 1779, was the second son of the Emperor Paul I. He early distinguished himself by activity, intellectual ability, and a gallantry bordering on foolhardiness, of which he gave remarkable proof at the battle of Austerlitz. After the congress of Vienna, the government of Poland was intrusted to him by his brother, the Emperor Alexander. In January 1822, he executed a private deed by which he resigned his claims to the throne in the event of Alexander's death; and when that event took place in 1825, he adhered to this resignation, although he had meanwhile in his absence been proclaimed emperor in St Petersburg. The succession thus fell to his younger brother Nicholas. The character of C.'s administration in Poland was not such as to conciliate any class of the people, and a widely ramified conspiracy was formed. The French Revolution of 1830 supplied the spark which set all in flame, and C. was obliged to flee for his life, but he returned in command of the army of reserve. He died, however, of cholera at Vitebsk, on 27th June 1831.

**CONSTANTINE**, Nicolaewitch, grand-duke of Russia, born 21st September 1827, is the second son of the late Emperor Nicholas, and the brother of Alexander II. He is grand-admiral of the Russian fleet, and holds besides innumerable military offices. During the Crimean war, he commanded the Russian fleet in the Baltic, and directed the defensive preparations which held the English and French armaments in check before Cronstadt. The leader of the old Russian party, he strenuously opposed the concessions made to the Western Powers. In 1857, however, he paid a visit to France, which was regarded as a sign that he was disposed to assume a conciliatory attitude towards civilisation. C. married, in 1848, a daughter of the Duke of Saxe-Altenburg, by whom he has had issue one son and three daughters.

**CONSTANTINO'PLE**, called by the Turks *Stamboul* or *Istamboul*, was originally called *Byzantium* (q. v.). In 330 A.D., the Emperor Constantine made it the capital of the Roman empire, and called it after his own name, Constantinople. From this period dates its importance. It continued thenceforth to be the residence of the Roman, and afterwards of the Byzantine emperors, till in 1453 it was taken by the Turks. Since that time it has been the capital of Turkey, and the principal residence of the sultans. It is situated in lat. 41° N., and long. 28° 59′ E., on the European side of the Channel of Constantinople or Thracian Bosphorus, near to its opening into the Sea of Marmora. A narrow arm of the sea, called the Golden Horn, extends about five miles into the land, and forms a safe and most commodious harbour, with water of sufficient depth to float the largest men of war. C. proper lies entirely on the southern side of the Golden Horn, and is protected by a wall built during the time of the Byzantine empire, and partially restored by the Turks. The wall is about 12½ miles in circuit, and is pierced by 28 gates, amongst which that of Top-Kapussi, formerly that of St Romanus, has a historic interest, as being the one through which the Turks entered when they stormed the city, and where the last of the Palæologi died in the fight. The suburbs of Galata, Pera, and Top-hanêh, are situated on the northern side of the Golden Horn. On the Asiatic side of the Bosphorus lie Scutari and Kadiköi (the ancient Chalcedon), and to the north-west of the city lies the town of Eyub. The city itself is built on hilly ground, and from this circumstance, and its numerous gardens, cypresses, mosques, palaces, minarets, and towers, it presents, especially as seen from the side of the Golden Horn, a very splendid appearance. The scenery of the Thracian Bosphorus is of almost unrivalled beauty; and the panorama, of which C. forms the principal part, is such as is perhaps nowhere else to be seen in the world. But a nearer approach reveals the usual characteristics of an eastern town—narrow, crooked, filthy streets, and miserable houses of wood and clay. It is only of late that dwelling-houses of stone have begun to be erected. The city contains, however, many fine buildings, among which may be mentioned the Seraglio, occupying the position of ancient Byzantium, and measuring about three miles in circumference; the former Church of St Sophia, now a mosque, a most magnificent structure, paved with waved marble to imitate the rolling of the sea, and having 107 columns of the finest porphyry, marble, and granite. This structure is in the form of a Greek cross, 269 feet long by 243 broad, and has a flattened dome, greatly admired for its lightness, 180 feet above the ground. At each of its four corners there is a tall minaret. The interior is covered with the richest Turkey and Persian carpets, and along the walls are recesses with white curtain screens, where the devout Turk can retire for prayer; while scattered here and there are small raised pulpits, where learned doctors expound the Koran. The other important mosques are those of Solyman, Achmed, Sultan Mohammed II., and Eyub. The two obelisks of the ancient Hippodrome, called by the Turks the *Atmeidan;* the Castle of the Seven Towers, now in a state of dilapidation; the aqueducts erected by the Emperor Valens; the cistern of Philoxenus, with 424 columns of marble; and the numerous fountains, are among the other most notable objects in Constantinople. The covered bazaars of C. are very numerous, and the goods are displayed with wonderful attractiveness. One feature of C. is its vast number of lean and hungry dogs, which haunt the streets, rendering it difficult to obtain a passage in some places. The dogs are the common property of the city, and they do a considerable portion of the scavenging. In the suburb of Khassim-Pasha are the ruins of the former palace of the Capitan-Pasha, the Lord High Admiral of the Turkish fleet; and not far from it is the great arsenal, where within recent years immense ships, carrying 140 guns, have been built. Galata, which was founded by the Genoese as a republic in the Byzantine times, is the residence of European merchants and the principal place of trade. It contains many great warehouses, shops, and dwelling-houses, but is, if possible, even more filthy than C. proper. Bridges of boats connect the opposite sides of the Golden Horn. Further eastward, on the Bosphorus, lies Top-hanêh, with the imperial cannon foundry, a beautiful mosque, and an interesting fountain. On the hill behind Galata and Top-hanêh, is situated Pera, the residence of the foreign ambassadors, whose palaces are conspicuous from a great distance. Here all the conveniences and luxuries of European life are now abundant. Many Greeks and Armenians inhabit Pera. Eyub is inhabited only by Turks, and here are preserved the *sanjak-sherif*, or the banner of the prophet, and the sword of Osman, with which each sultan is girded on his accession, a ceremony equivalent to coronation.

C., including its suburbs, contains about 800,000 inhabitants. The proportion of Turks, Greeks, Armenians, and Jews, is very variously estimated. The mosques are more than 300 in number. There are several Greek churches, under a patriarch with twelve synodal bishops. The patriarch is not only the spiritual, but in part also the temporal head of the Greek subjects of the Porte. C. is the residence also of an Armenian patriarch, and there are several Roman Catholic and Protestant places of worship. There are in connection with the mosques about 300 *medresses*, or schools for the ulemas; there are also some 400 *mekteb*, or Turkish elementary schools; and among the other educational institutions is a school of medicine conducted by Germans, which has been the means of much good. Among the benevolent institutions are numerous *imarets*, where food is provided for the poor, and hospitals for the sick of several European nations. There are public libraries, both Turkish and Greek, of which that of the Seraglio is particularly rich in the treasures of oriental literature; and there are several Turkish and European printing-presses. In 1853, two Turkish, one French, one Greek, one Armenian, one Bulgarian, and several Italian journals were printed; and within the last two or three years an English newspaper has been established. The public baths and coffee-houses are exceedingly numerous. Some of the peculiar manufactures of the East are carried on in leather, carpets, weapons, &c. But all the manufactures of Western Europe abound in its markets. Notwithstanding the want of fostering care on the part of the government, whose measures have rather been adverse to commercial prosperity, the trade of C. has been steadily increasing, but is by no means so extensive as might be expected from its population and situation. In 1856, 17,868 vessels of 3,702,467 tons burden entered, and 18,406, with a tonnage of 3,676,302, cleared the port of Constantinople. Very nearly half of this commerce, however, seems attributable to the war, which had not been concluded in the beginning of that year. In the following year (1857) the number of ships entering C. was 8557, with a tonnage of 2,093,502, and the number clearing 8485, tonnage 2,120,850. In 1859, however, the commerce had greatly increased (and this increase does not appear to be owing to any extraordinary circumstance), the number of vessels entering being 15,588, with a tonnage of 3,051,229, and the number clearing 15,232, with a tonnage of 3,002,066. The trade is chiefly in the hands of Greeks, Italians, Austrians, British, French, and Germans. The liberal reforms of Sultan Mahmoud II., and the intimate connection now subsisting with Western Europe, have of late years given to the Turkish capital a much more European appearance than it formerly had. C. has at various times suffered dreadfully from fire. It has also been subjected to no less than 24 memorable sieges, 18 of which it withstood.

**CONSTELLA'TION** (Lat. *con*, together, and *stella*, a star), a group of stars. The stars which stud the firmament have, from a time earlier than authentic records can trace, been formed into artificial groups, which have received names borrowed from fancy or fable. These groups are called constellations. Though quite devoid of anything like systematic arrangement, this traditional grouping is found a sufficiently convenient classification, and still remains the basis of nomenclature for the stars among astronomers. Before the invention of almanacs, the risings and settings of the constellations were looked to by husbandmen, shepherds, and seafaring men as the great landmarks of the seasons, and consequently of the weather which each season was expected to bring with it (see Job xxxviii. 31); and it is not surprising if the storms or calm weather that usually accompanied such seasons were connected in the popular imagination with the influence of the stars themselves, or the beings with whom superstition or fable identified them. Thus, the risings and settings of Bootes with the bright star Arcturus, which took place near the equinoxes, portended great tempests. See Virgil's *Georgics*, i. 204. The great heat in July was ascribed to the rising of Canis the Dog, with its bright star Sirius. See CANICULAR DAYS, and HELIACAL RISING. The appearance of the twins, Castor and Pollux, was hailed as the harbinger of fair summer weather.

Almost all nations have, from early times, arranged the stars into constellations, but it is chiefly from the nomenclature of the Greeks and Romans that our own is derived. Eudoxus, a contemporary of Plato, about 370 years B.C., gave a description of the face of the heavens, containing the names and characters of all the constellations recognised in his time. Though this production is lost, a poetical paraphrase of it, written about a century later by Aratus (q. v.), is still extant. This poem describes twelve zodiacal constellations (see ZODIAC), with twenty in the northern hemisphere, and thirteen in the southern. The next enumeration occurs in the *Almagest* of Ptolemy, which includes the preceding, with three additional, one northern and two southern constellations, making in all 48. These are the ancient stellar groups. Large accessions have been made to the nomenclature in modern times, in consequence of maritime discovery having made us acquainted with constellations in the southern hemisphere which never rose upon the world known to our ancient authors. Some stars also of the northern heavens, not included in the ancient groups, have been formed into new ones. In 1751, Lacaille went to the Cape for the purpose of making a catalogue of the southern stars, and forming them into constellations—an undertaking which he prosecuted with great ardour for nearly four years at the expense of the French government. Flattery has also contributed towards the stellar nomenclature. Upon the restoration of Charles II., the evening before his return to London, Sir Charles Scarborough, the court physician, was gazing upon a star in the northern heavens, which shone with greater luminosity than usual, as might be expected from a loyal star on such an occasion. This, in connection with a few others, was formed into Cor Caroli, the Heart of Charles II., by Halley, at the doctor's recommendation. The chief constellations will be noticed under their several names. See ARIES, URSA MAJOR, &c. The fanciful figures from which the constellations are named, are depicted on celestial globes and maps of the heavens.

**CONSTIPA'TION**, a state of the system marked by an irregular and sluggish action of the bowels upon their contents, due either to defective secretion of the juices of the intestinal mucous membrane, or to an imperfection of the peristaltic movements (see DIGESTION). Sedentary habits predispose to C., as also does the use of animal food in too great a relative amount. The use of brown bread, or of lentils, oatmeal porridge, of green vegetables and salads, or of ripe fruits; the plentiful employment of salt, or of saline drinks, or of many natural mineral waters; and active exercise, especially by walking or riding on horseback in the open air, tend to avert this disease. A favourite remedy with some is the use of a cloth wrung out of cold water, and applied to the abdomen; this, as used at hydropathic establishments, is called an 'abdominal compress,' and is worn under a bandage of macintosh cloth, to keep the moisture from escaping, during the earlier part of the day. But to many persons affected with C., and unable from circumstances to follow out the plan of life here indicated, and to many others in whom the disease does not yield to these means, the use of laxatives, or mild cathartics (q. v.), is almost a necessity; and it is satisfactory to know that these remedies, if judiciously selected, and not employed so as to produce over-action, may be taken during very many years without any of the bad effects often ascribed to them.

*Constipation in the lower animals* depends, as in man, on imperfect secretion from, or motion of, the intestinal walls. In the horse, it is usually accompanied by Colic (q. v.), and when long continued, leads to Enteritis (q. v.). The appropriate remedies are soap and water clysters given every two hours; smart friction and cloths wrung out of hot water applied to the abdomen, with three drachms of aloes, and one of calomel, given in gruel, and repeated in sixteen hours, if no effect is produced. Give, besides, walking exercise; restrict the amount of dry solid food, but allow plenty of thin gruel or other fluids, which may be rendered more laxative by admixture with treacle or a little salt. Similar treatment is called for in dogs, cats, and pigs. In cattle and sheep, digestion principally takes place in the large and quadrisected stomach; the bowels, accordingly, are little liable to derangement; and C., when occurring in these animals, generally depends upon impaction of dry hard food between the leaves of the maniplies, third stomach, or fardel-bag. The complaint is hence called *fardel-bound*. It results from the eating of tough and indigestible food, such as ripe vetches, rye-grass, or clover; it prevails in dry seasons, and on pastures where the herbage is coarse and the water scarce. It occurs amongst cattle partaking freely of hedge-cuttings or shoots of trees, hence its synonym of *wood-evil*. From continuous cramming and want of exercise, it is frequent in stall-feeding animals; whilst from the drying up of the natural secretions, it accompanies most febrile and inflammatory diseases. The milder cases constitute the ordinary form of indigestion in ruminants, are accompanied by what the cow-man terms *loss of cud*, and usually yield to a dose of salts given with an ounce or two of ginger. In more protracted cases, rumination is suspended, appetite gone, constipation and fever are present. There is a grunt noticeable, especially when the animal is moved, and different from that accompanying chest-complaints, by its occurrence at the commencement of expiration. By pressing the closed fist upwards and forwards beneath the short ribs on the right side, the round, hard, distended stomach may be felt. This state of matters may continue for ten days or a fortnight, when the animal, if unrelieved, becomes nauseated, and sinks. Stupor sometimes precedes death, whilst in some seasons and localities most of the bad cases are accompanied by excitement and frenzy. In this, as in other respects, the disease closely corresponds with stomach-staggers in the horse.

*Treatment.*—Give purgatives in large doses, combining several together, and exhibiting them with stimulants in plenty of fluid. For a medium sized ox or cow, use ¾ lb. each of common and Epsom salts, ten croton beans, and a drachm of calomel, with three ounces of turpentine; and administer this in half a gallon of water. If no effect is produced in twenty hours, repeat the dose. Withhold all solid food; encourage the animal to drink gruel, sloppy mashes, treacle and water; and give exercise, clysters, and occasional hot fomentations to the belly.

**CONSTITUENT ASSEMBLY.** See Assembly, National.

**CONSTITUTION**, in Politics (*constitutio*, from Lat. *constituere*, to set up, or establish). In its modern acceptation, C. signifies a system of law established by the sovereign power of a state *for its own guidance*. Such being the ultimate object of a C., its proximate objects, generally stated, are, to fix the limits and define the relations of the legislative, the judicial, and the executive powers of the state, both amongst themselves and with reference to the citizens of the state, regarded as a governed body. Among the Romans, a C. was at first nearly synonymous with the edict of a prætor (see Edict), and even under the empire signified only an imperial edict or decree. In continental countries, since the formation of the federal government of the United States of America, or, at all events, since the first French Revolution, the idea of a C. has been generally that of a body of written public law, promulgated at once by the sovereign power. See Code and Assembly, National. In Great Britain it is the whole body of the public law, consuetudinary as well as statutory, which has grown up during the course of ages, and is continually being modified by the action of the general will as interpreted and expressed by the parliamentary representatives of the nation. Much confusion is often introduced into our conceptions of the action of the English and other mixed governments by representing the three elements of which they are generally composed—the monarchical, aristocratic, and democratic (King, Lords, and Commons)—as the centres of three independent sovereignties, whereas they are only three organs through which the one sovereignty finds expression. There is, and can be, in an independent state, but one sovereignty—one centre of power—viz., the general will of the nation. Opposition to this will, from whencesoever it may come, within the state, is treason in the individual, and rebellion in the mass; whereas the vindication of this will by its own act may be revolution, but can never be rebellion. Another source of error consists in supposing this general will to be the numerical aggregate of all the individual wills in the community. It is, on the contrary, the sum of all the wills, not numerically but really, making allowance, that is to say, for the fact that one individual, from the greater clearness of his convictions and strength of his character, often contributes to this sum, or mass of volition, ten times as much as another individual.

But though the idea of a mixed government is generally associated with that of a C., it does not seem to be inseparable from it. We are not entitled, for example, to deny the name of a C. to a system which is apparently the result of one single will, if to that will the general will has freely confided the task of determining the rules by which it shall be governed. Assuming that the present emperor of the French was invested with supreme power by this ultimate sovereign, the general will, the government which he has established is, for the time being, the C. of France. But inasmuch as France has, under the present system of government, no parliamentary machinery for effecting desired or desirable changes in its C., the 'right of revolution,' as it is called, becomes a necessity on the part of those who conceive that they embody and are in a condition to express the general will. Disorderly as it may seem to us, it is really within the limits of the C., as constitutional as the C. which at any moment it may overthrow. In a parliamentary government like that of England, however, the right of revolution emerges only when the self-modifying powers of the C. are obstructed or opposed by the executive, as took place in 1688. Whilst in pure monarchies it hangs permanently over the head of the executive, even when acting in accordance with the C., in a free country resistance is rebellion in all cases in which the machinery which the C. possesses for its own modification is unimpeded in its action. Of resistance of this latter kind, the events now (1861) occurring in the United States of America seem to furnish an example.

For a historical account of the English C., see England; see also Parliament, Congress, Code, Cortes, &c.

**CONSTITUTIONS,** Apostolical. See Apostolical Canons and Constitutions.

**CONSTITUTIONS OF CLARENDON.** See Clarendon, Constitutions of.

**CO'NSUBSTANTIA'TION.** See Transubstantiation.

**CONSUETU'DINARY LAW,** is that law which derives its binding character, not from the expressed, but from the tacit consent of the general will of the community. As it is generally transmitted from age to age by oral tradition and universal custom, and is rarely embodied in any positive enactment, C. L. is often spoken of as unwritten law (*lex non scripta*). The customary laws of Normandy, Brittany, and some other provinces of France, however, were reduced to writing; and with us much of the common law, both of England and Scotland, now rests on statute, as well as on custom and usage. Even in modern practice, usage is often resorted to as the best interpreter of law. Of this a familiar example is the important part assigned to mercantile usage in construing the law-merchant. In this case, the custom must generally be established by evidence, in place of being taken for granted, as are the laws of primogeniture, legitim, terce, courtesy, and the like. The effect of custom in repealing statutes will be considered under Desuetude. See also Common Law.

**CO'NSUL,** the title of the two highest ordinary magistrates in the Roman republic. The etymology of the word cannot be precisely determined; thus much, however, seems clear, that it implies that there were more than one—that there were colleagues. The idea of two supreme magistrates, or joint-presidents of the state, seems to have been interwoven with the earliest conceptions of political organisation in Rome. According to tradition, there were at first two kings; and the constitution of Servius is said to have provided for the sovereign power being again divided between two functionaries. But it was not till after the expulsion of Tarquin that Lucius Junius Brutus and Lucius Tarquinius Collatinus were chosen joint-heads of the state. These chief-magistrates seem to have been at first called *prætores* (leaders, i. e., of the armies), and the title of *consules* to have been introduced about 300 B. C. At first, the consuls seem to have differed from the kings in little else than their limited tenure of office, and the power which their fellow-citizens retained of calling them to account at its termination. They never assumed the golden crown, but their dress in almost every other respect was regal, and they had ivory sceptres surmounted by eagles. In public assemblies, they occupied a sort of throne (*sella curulis*), and in the senate they presided and sat on elevated seats. They made peace and negotiated foreign alliances, had the supreme command of the army, and appointed the public treasurers. They likewise exercised the judicial functions of royalty. In their capacity of supreme judges they continued to be known as *prætores*, until ultimately separate magistrates with that title were appointed. The symbol of their authority was the bundle of rods (*fasces*), with the axe in the centre, which was carried before them by twelve lictors. For a considerable period, the consuls were chosen exclusively from the *populus* or patricians, as opposed to the *plebs;* and during the long struggle between the patricians and plebeians, they sided invariably with their own order. At length, however, two plebeian officers, called *tribuni plebis*, were appointed as a sort of democratic rivals to the aristocratic consuls. To them was assigned the duty of presiding in the assemblies of the plebeians, as the consuls did in the other assemblies; and though they could not dictate, they were entitled by their *veto* to arrest measures proceeding on consular or senatorial authority. The result of this rivalry was, that the consulship was opened to plebeians; and from 172 B. C. down to the period of the empire, the consuls were frequently plebeians. In accordance with the ordinary course of political development, the organisation of the Roman state became more complicated, in proportion as it became impossible for the C. to discharge in person the various duties which in the beginning always centre in the possessors of supreme power. In 442 B. C., censors (q. v.) were appointed. In 365, prætors had the chief judicial functions of the consuls assigned to them. In the government of the provinces, the aid of the former consuls was called in, the C. thus appointed having the title of *pro-consul.* In sudden and critical emergencies, the consuls were either superseded by a dictator (q. v.), or absolute power for the occasion was conferred on them by the decree of the senate, which ran in the famous formula: *Videant consules ne quid respublica detrimenti capiat* —'Let the consuls look to it, that the state take no harm.' The oath which the consuls took on entering office they were obliged to repeat as a declaration, not of intention but of fact, on quitting it at the end of the year. The consuls were inaugurated by a great procession to the Capitol and a sacrifice to Jupiter Capitolinus. The shadow of the consulate survived the downfall of liberty; but the election of the consuls was taken from the people and conferred on the senate. Then their number was increased; they were divided into classes—*C. ordinarii, suffecti, honorarii,* &c.—till at last the office became a mere honorary appointment conferred by the emperor.

The title of C. was revived in the French republic. See Consulate.

**CONSUL,** Mercantile, the name given to those officers whom the state maintains in foreign countries for the protection of its trade, and vindication of the rights of its merchants, and to whom the further duty is assigned of keeping the home government informed of all facts bearing on the commercial interests of the country. The practice of appointing such officers originated among the trading communities of Italy about the middle of the 12th c., and gradually extended itself; and in the 16th c., had been adopted by all the countries of Europe. In addition to their commercial duties, others of a more strictly political kind were frequently confided to consuls in places in which there was no ambassador or political agent. In almost all the countries of Europe, consuls are divided into consuls-general, consuls, vice-consuls, and consular agents. The C.'s first duty on his arrival, is to exhibit his commission to the authorities of the country to which he is accredited, in order that he may obtain their sanction to his appointment. This sanction is communicated to him in a document called an *exequatur*, which secures to him the enjoyment of such 'privileges, immunities, and exemptions as have been enjoyed by his predecessors, and as are usually granted to consuls in the country in which he is to reside.' The general duties of English consuls are communicated to them in printed instructions. In these the C. is ordered to make himself conversant with the laws and general principles which relate to the trade of Great Britain with foreign parts, and with the language and municipal laws of the country wherein he resides. Further, it is his duty to protect his countrymen in the lawful exercise of their trade, to quiet their differences, to obtain the redress of injuries done them—failing which, to report the matter to the English ambassador at the court of that nation—and to forward to the Secretary of State for Foreign Affairs an annual return of the trade carried on at the different ports within his consulate, as well as a quarterly account of the market prices of agricultural produce during each week of the quarter, the course of exchange, &c. The C. must afford relief to British seamen or other subjects wrecked on the coast, and endeavour to procure them the means of returning to England. The commanders of Queen's ships touching on the coast are entitled to call on him for intelligence, and aid in procuring supplies of water, provisions, and the like; and it is his duty to endeavour to recover all wrecks and stores, &c., of Queen's ships, whether found at sea and brought into the port at which he resides, or thrown on the coast. As regards the 'privileges and immunities' of a C., it is doubtful whether he is in any case exempt from the civil jurisdiction of the state to which he is accredited; and in the case of a trading C., it is at anyrate plain that he is not. But a C. sent out from this country, and not engaging in trade, has always been exempted from the taxes of the country in which he resides. He is generally permitted to call in a guard when he requires it for his own safety, or the preservation of discipline; and in countries not inhabited by a European population, he has all the privileges of an ambassador. A C. can perform all the acts of a notary-public; all deeds executed by him being acknowledged as valid by our courts of law. The fiction is, that the consulate is the territory of the country from which the C. is sent, and, consequently, that deeds and acts done within it, or under the C.'s seal, are done in England. Hence the marriage of British subjects recorded in the books of a British C. is a valid ceremony.

Considering the magnificent name which they bear, and the real importance of their office, both the rank and remuneration awarded to consuls by this country are certainly inadequate. Even a consul-general ranks only with a post-captain in the navy, or a major in the army; a C., with a commander in the navy, or a captain in the army. The more important matter of remuneration is scarcely more satisfactory. A few consuls-general have £1500, £1600, and even £1700 a year, but consuls, on an average, probably do not exceed £400; whilst vice-consuls as often receive under as over £200, sometimes £50, and consular agents even £40 a year. The unsatisfactory condition of the consular service of this country has been a subject of frequent remark and discussion.

**CO'NSULATE** (Lat. *consulatus*, consulship), (in France). This supreme magistracy of the French republic was established after the revolution of the 18th Brumaire (q. v.), and lasted to the coronation of Napoleon. On the sudden overthrow of the Directory with the constitution of the year III., the members of the Council of the Ancients and the Five Hundred, or rather those of them who approved of, or submitted to, that act of violence on the part of Bonaparte's grenadiers, appointed three consuls—Sièyes, Bonaparte, and Roger Ducos. This approach to a monarchical government was confirmed, December 13, 1799, by the constitution of the year VIII., by which Bonaparte was made First Consul, with Cambacérès and Lebrun as second and third; each was elected for 10 years, and was re-eligible. The powers of the First Consul were made almost absolute. He promulgated the laws, appointed or dismissed ministers, ambassadors, members of the Council of State, military and naval officers, and all civil and criminal judges, except justices of peace and members of the Court of Cassation. His income was fixed at 500,000 francs, and that of his inferior colleagues at 150,000 francs each. Bonaparte took up his residence at the Tuileries, and held a splendid court. By resolutions of the senate, in May 1802, Bonaparte was re-elected for 10 additional years, and in August of the same year was made First Consul for life. In the appeal made to the nation, out of 3,577,259 votes, 3,568,885 were in favour of Bonaparte. The adulation of the senate and people now knew no limit. Nothing but the imperial name and insignia were wanting to complete the picture of absolutism, and these were supplied, May 18, 1804, when Napoleon was made emperor.

**CONSU'MPTION**, in medical language, Phthisis, Tabes, Marasmus (q. v.), and more particularly Phthisis Pulmonalis or pulmonary C., is a disease of great frequency and severity, which, in the civilised nations of Europe, produces from one-sixth to one-tenth of the total mortality in ordinary times. It is uncertain whether there is any part of the world, or any race of men, exempt from C.; this exemption having been at different times claimed for the inhabitants both of hot and cold climates, as for India, Australia, Canada, Iceland, &c., but in most instances in consequence of imperfect knowledge of the facts. On the whole, C. appears to be one of those diseases that have a tendency to increase, unless great care be taken to remove conditions unfavourable to the public health, with the increased aggregation of the human family, and with that extended intercourse which is one of the consequences of an advanced civilisation. Hence it is most frequent and most fatal in towns, and most of all in those that are near the great centres of intercourse; while in remote mountain districts, in islands cut off by a wide ocean from the general stream of human communication, it is commonly stated to be, and probably is, comparatively rare. As a rule, however, the presence of this dreadful scourge has almost invariably been discovered to a greater or less extent, wherever the causes of mortality have been carefully examined under enlightened medical superintendence; and we are still very far from having acquired such an insight into its laws of diffusion, as to be able to deduce from them any exact doctrine as to its causation. C. affects peculiarly the young, especially those in the first period of adult life; though it is nearly certain that the seeds of the disease are commonly sown in the constitution in youth, and even in infancy. Its relation to sex is variable, being apparently determined in part by the predominating occupations, and the habits of living, of the population. It is often observed to be plainly inherited from one or other parent, most frequently the mother; and it is one of the diseases which has been stated to be frequently developed as a consequence of the marriage of cousins or other near relatives, especially when the parental stock is itself tainted or not free from suspicion. In life-insurance, all these circumstances are usually carefully weighed by the medical officers of companies, as the grounds for admission or rejection of a candidate for insurance; and nothing is more certain to cause rejection, than a well-grounded suspicion of a consumptive tendency, either personal or derived from the parents, or shewn in brothers and sisters. It is therefore a fair subject for consideration, on grounds of ordinary prudence, as well as on those of moral and religious obligation, whether those afflicted with this malady, or strongly predisposed to it, ought to enter into the married state, and to incur the probable afflictions and responsibilities connected with the maintenance of an unhealthy family. It has even been proposed to legislate on this subject; but sober-minded political economists will probably always consider that it is in vain to constrain by laws the strongest instincts of humanity, especially when the application of the law must depend upon such refined distinctions as in the present instance. The subject is clearly one for an appeal to the reason and conscience of individuals, rather than for an attempt to lay down theoretical rules of conduct; but those who would guide their lives by principle, and who would not rush into marriage from the inferior motives alone, would do well to take it into serious consideration.

Among the determining causes of C. in large populations, the best ascertained are those connected with overcrowding and bad ventilation, especially when connected with all the depressing influences inherent in poverty, or associated with a reckless and abandoned life. It is certain that much might be done to improve the public health in this respect, by more attention on the part of the employers of labour to the comfort and habits of those who are, in more senses than one, their 'hands,' and the sources of their prosperity. A certain amount of improvement has, indeed, already been effected by the improved living of the working-classes during the last twenty years. Still it is well known, and proved by careful inquiries, that the workshops of tailors, printers, bakers, and other businesses carried on in close, ill-ventilated apartments, by large numbers of workmen, are, in a very aggravated sense, nurseries of consumption. Cotton and linen factories have also been shewn, when ill regulated, to be largely responsible for the death of their inmates from this disease. The finest regiments in the army were proved, some years ago, by evidence before a royal commission, to be decimated by this disease in time of peace to a frightful extent, in consequence, probably, of the bad ventilation and deficient comforts of the barracks. The cutlers and needle-grinders of Sheffield appear to owe their notoriously short lives to C., brought on by the inhalation of metallic particles in the close and stifling atmosphere of their workshops. The stone-hewers of Edinburgh and Glasgow, and the colliers of the Lothians, were some years ago in a similar predicament, from the inhalation, in the one case of stone-dust, in the other of lamp-smoke not sufficiently diluted with air. And even agricultural labourers, in many parts of the country, suffer from C. to an extent that is quite appalling, owing to the discomforts, and particularly the close and overcrowded condition of their dwellings. It is lamentable to think that such evils as these exist, and that they might be to a great extent avoided; but this conclusion appears to follow legitimately from the evidence that has been adduced of the intimate connection of C. with overcrowding and a diminished supply of fresh air in workshops and dwellings. Some years ago, Dr Guy published the details of an inquiry into the health of the journeymen printers of London, from which it appeared, in the clearest manner, that the liability of these workmen to spitting of blood, and other well-known symptoms of C., was in exact proportion to the degree to which they had been subject to the evil influences of ill-ventilated workshops; and the marked improvement in the health of our prisons in the present day, has likewise been shewn to be to a considerable extent due to the diminished prevalence of C. among the inmates; which, again, is attributed, on good evidence, to the improved construction of the cells, and the increased facilities for wholesome exercise and occupation given to prisoners under confinement for lengthened periods. It has even been plausibly maintained, that in some of our modern jails C. is less prevalent than it is among the general population of the classes from which prisoners are chiefly taken; so that the fact of confinement, and the depressing influences of a penal discipline, are more than counterbalanced by the effect of a regular life, wholesome but plain food, and a sufficient amount of occupation to maintain mind and body in a sound state. Even admitting, therefore, that the causes of C. may be in part practically irremovable, there seems no reason to doubt that very much might be done to diminish its prevalence, as well as to arrest its course when already formed, by due attention to the comfort of the labouring population, both in their dwellings and in the pursuit of their daily occupations.

The general symptoms of C. are patent to every eye; the more accurate appreciation of them, however, and the use of the more strictly medical means for detecting the disease, and judging of its progress and probable issue, are among the more difficult of the duties of the physician. The disease often escapes attention in its early stages; yet not so much from the absolute difficulty of its detection, as from the insidiousness of its invasion, and the small alarm which its early symptoms excite in the mind of the sufferer, and even of his friends, when much occupied with the business of life, or when naturally not gifted with the faculty of refined observation. Whenever a young person appears to lose flesh and strength without known cause; when the colour changes much from day to day, and from hour to hour; when shiverings are complained of, or even a sense of too great chilliness, alternated by flushings and an oppressive warmth, or too copious perspiration; when with these symptoms there is cough, however slight, or pains between the shoulders and about the shoulder-blades, or below the collar-bones; when there is an occasional tendency to spit up small quantities of blood from the chest, or when the patient is subject to repeated attacks of catarrh (q. v.), or when the bowels are habitually loose or very irregular, or when with any one of these symptoms in the female there is diminution or suppression of the usual periodic discharges, it is not too soon to apprehend the occurrence of C., and to place the patient under medical advice. In some instances the alarm may appear groundless, and health may rapidly return under appropriate treatment; but a far greater danger is that these symptoms, being overlooked or neglected, may prove only the precursors of a more apparently serious attack of disease, and that the first suspicion of C. may arise only after irreparable mischief has taken place. In general terms, it may be said that during the period of adolescence—i. e., before the body has assumed its full development in regard to strength and weight—no considerable check to its advance in these respects ought to pass unnoticed, more especially if attended with habitual feverishness, cough, or other symptoms of impaired health.

Attempts have been made to shew, that a peculiar habit of body or physical conformation, apart from disordered health, is to be regarded as predisposing to C.; and this has been called the phthisical diathesis (q. v.), but little or no dependence can be placed on any such indications, for this disease unquestionably occurs with nearly equal frequency in all the physiological varieties of the human race, when exposed to its exciting and predisposing causes. The experienced eye of the physician, however, will often discover the lurking germs of this insidious malady, even when active symptoms have been long absent, or have recurred after a long period of comparatively good health, by the effect of former disease upon the development of the frame in the period of childhood. For a similar reason, the use of the stethoscope (q. v.), and other means of minutely examining into the state of the chest, will sometimes detect a wholly unexpected attack of pulmonary C. in persons who suppose their lungs to be quite sound, or who have forgotten that they were ever subject to disease. As a rule, however, the symptoms mentioned above are pretty safe guides as to the commencement of C., if care be taken that their gradual progress does not cause them to be overlooked. In a few cases the disease begins otherwise, the form being that of an acute attack, such as fever or inflammation of the chest; but such cases are of course at once detected, as being serious enough to require medical advice.

The further medical history of C. is very complicated, and can hardly be treated of with advantage in a work like the present. Generally speaking, the progress of the disease is marked by the following symptoms: progressive emaciation, with habitual fever and frequent sweating at night; cough and pains in the chest, with expectoration of mucus, and, in the end, of purulent matter in large quantities; diarrhœa (q. v.), and sometimes obstinate vomiting, oftener failure of the appetite, with occasional sickness; gradually increasing weakness and indisposition for active exertion, often with more or less difficulty of breathing on exertion, but rarely with extreme distress or pain of any kind. This remarkable freedom from acute suffering is probably one reason of the self-deception usually attributed to consumptive persons, by which they are led to believe in their curability up to a very advanced stage of the disorder.

The degree to which C. is curable has been a fruitful subject of discussion of late years. Properly speaking, there never has been any doubt that cases marked by all the symptoms of C. occasionally, and even pretty frequently in the early stages, get well; but it was argued that these were probably not genuine instances of what is now alone technically called C.—viz., tubercular disease. In France, where morbid anatomy was extensively cultivated in the beginning of the present century, the incurability of the tubercular form of C. was a general doctrine of the schools till the time of Laennec (q. v.), who, by multiplied instances, and careful observations on the dead body, shewed beyond all question the occasional arrest even of advanced C., and the frequent cure of it in the early stages. The appearances in the lungs, and other organs of persons affected with C., will be discussed under TUBERCLE.

The treatment of C. is a very complicated subject, and one much misunderstood, partly owing to the misrepresentations of quacks, and partly from the great demand for palliative remedies on the part of patients and their friends, tending to obscure the true principles of treatment even to the mind of the physician. It is, however, now well ascertained that the greater part of the cure consists in hygienic measures—i. e., the regulation of the mode of living, the occupation, the diet, the clothing, the food, the hours of repose, &c., of the consumptive—and all treatment by drugs is usually regarded by well-informed physicians as subordinate to that just mentioned. A life in the open air to a considerable extent, and in a climate which admits of the enjoyment of such a life even in winter, is the best restorative in cases of incipient C.; yet too much may be sacrificed to the desire of obtaining these advantages, if a genial climate is sought at the expense of the comforts of an English home, or with the effect of producing anxiety of mind, or exhaustion of body by a long and fatiguing journey. Moreover, to many men a regular occupation is really a necessity in more senses than one; and to break up all the associations of habit in a person debilitated by disease, and not capable of seeking new sources of excitement, is to poison the springs of enjoyment, and render the remainder of life a burden. Many consumptives have been sent abroad only to die, and in all probability to die more miserably, and at an earlier period, than if they had remained at home. On the other hand, the favouring influences of climate are by no means to be rejected, when they can be obtained in accordance with the patient's previously formed habits, and with due regard to his means of occupation and prospects of eventual cure. A varied and wholesome, but light and unstimulating diet, including abundant dairy produce; flannel coverings next the skin, and clothing which is warm but not oppressive; a well-ventilated sleeping-apartment, with a moderate fire in cold weather; bathing in tepid water; the use of a respirator or of a light woollen covering for the mouth and nose in excessively cold weather; avoidance of late hours, crowded rooms, and every kind of dissipation; avoidance also of draughts of cold air, and of sitting in damp clothes or with damp feet; these are the principal circumstances to be kept in view in the ordinary regulation of the life of a consumptive patient. The use of cod-liver oil has been very popular of late years in the treatment of C.; but it may be reasonably doubted whether the reputation of this remedy be due to its powers as a medicine or simply as a fattening food. Occasional small opiates, and other medicines to arrest irritating cough and subdue feverishness, and in special cases the treatment proper to the complications, such as diarrhœa (q. v.) and breathlessness, are generally admitted as useful adjuncts to the means above mentioned; but they can hardly be discussed in this place with advantage, and should be in general used only under medical advice. See Ancell on Tuberculosis—on Phthisis (translated for the Sydenham Society).

*Consumption in the Lower Animals.*—C. rarely occurs in horses, the health-depressing influences which produce it in man and other animals inducing in them Glanders (q. v.) and Farcy (q. v.). It is also rare among dogs, but is common in oxen and sheep, and still more so in pigs. It is one of the chief causes of death amongst the apes and other denizens of our zoological gardens. It is produced, as in man, by overcrowding, damp lodging, bad food, neglected colds, and the like debilitating causes. It is notoriously hereditary; is frequently developed by breeding from parents nearly related to each other, and mostly affects animals of faulty conformation, prevailing, for example, amongst cows with small thin necks, narrow carcasses, hollow flanks, and dirty unhealthy-looking skins. Such animals are, moreover, subject to dysentery; indeed, the two diseases depend, in cattle, on the same tuberculous or scrofulous state of system; they occur in the same stocks, and often replace each other in different generations. In all animals, the well-marked symptoms are very analogous. In cows, appetite and rumination become irregular; the coat stares, the skin is dry, and firmly adherent to the ribs; the animal is dull, loses flesh, is sometimes feverish, and if in milk, the secretion is diminished, blue, and poor; a tickling cough is easily excited; and diarrhœa is readily set up, and once established, is arrested with difficulty. As the disease advances, the lymphatic glands about the neck and elsewhere are enlarged; the fever, cough, and debility increase; the pulse is weak and quick; the excretions are fœtid; and purulent discharges trickle from the eyes and nostrils. C. in the lower animals is certainly curable, especially in the earlier stages. The treatment consists mainly in attention to regimen and diet, with careful protection from damp, cold, and other causes inimical to health. The food should be good, easily digested, and nourishing, and the capricious appetite coaxed by frequent variety. For cows, linseed or other convenient oleaginous articles should be freely used. Irregularity of the bowels may be remedied by an occasional dose of treacle, or by a small quantity of linseed or of castor oil; but active purgatives, and, indeed, all powerful and irritating drugs, must be avoided. A few simple tonics may sometimes be advisable. C. might be greatly limited by rejecting, for breeding purposes, all animals having any tuberculous taint, and by greater attention to the feeding, shelter, and warmth of young stock. Neglect of these latter precautions is the cause of its unusual prevalence amongst the young cattle of the more exposed parts of our eastern coast. Its connection with overcrowding and faulty sanitary arrangements, is evident from its frequent occurrence amongst the cows that have for several months been inmates of our badly managed town-dairies.

**CONSUMPTION**, in Political Economy, is the converse of Production (q. v.). The word is of very frequent use by political economists, but it has never had a definite meaning attached to it. It may be generally said, that everything which is produced or made by human labour is to be consumed, or to cease in its turn to exist. But there is not only a great difference in the rate at which things are consumed—some going rapidly, while others last for centuries—but there is a C. which is annihilation or loss, and a C. which is in reality gain, or an addition to the wealth of the world. Food is an article of production destined to be immediately consumed, but the food of the working-man sustains him while he is producing more than he consumes. A thousand pounds spent in improving a thousand acres of land, or in building a house, produce something which lasts for many years ere it is consumed or rendered valueless. The same sum spent in raising a wheat crop will seem to be immediately consumed, but it may have in reality been laid out more beneficially than the other, through the process of reproduction. If the thousand pounds laid out on land increases the value of that land so as to make it worth eleven hundred pounds, while the wheat raised by the expenditure of the other thousand is sold for fifteen hundred pounds, there is less C. in the latter expenditure than the former. If the thousand pounds, on the other hand, be expended on squibs and sky-rockets, the C. is greater still. The makers of the squibs and sky-rockets no doubt live, but it would tend less to C. if they lived by making something that would last.

**CO'NTACT.** In Geometry, two lines, one of which at least is curved, are said to be in C. when they have a common point from which they recede, in such a way that the deflection of the one from the other will, if a sufficiently small departure be taken, become as small a fraction as we please of that departure. A complete discussion of the nature and order of C. can be obtained only by means of the differential calculus.

**CONTA'GION**, the communication of a disease from the sick to the healthy, either by direct contact of a part affected with the disease, or through the medium of the excretions and exhalations of the body. Some authorities have employed the term infection (q. v.) to designate this latter method of communication, and have correspondingly limited the meaning of the word C.; but no practical end is served by this refinement, and it has indeed led to great confusion by obscuring the fact of the communication, which is, when clearly proved by instances, the most important element in the inquiry. If of a given number of healthy persons exposed to association with the sick, a much larger proportion becomes ill than can be reasonably accounted for on general principles, or than is actually observed among persons of similar habits not exposed to this cause of disease, the disease is said to be propagated by C.; and if the characters of the disease are well marked, and nearly similar throughout the group of cases, it is said to be due to a specific C., which may be in some cases shewn to be capable of reproducing the primary disease to an illimitable extent, being conveyed (as in the case of syphilis, q. v.), either through the liquid secretions of the affected part, or (as in the case of small-pox) in this way, and also through the aërial exhalations. Contagious diseases are generally epidemic (q. v.) in their mode of propagation, attacking large numbers of people at once, and travelling from place to place with the affected multitudes. There are, however, epidemic diseases, which are by no means generally admitted to be contagious, as influenza (q. v.).

**CONTARI'NI**, the name of a noble family in Venice, one of the twelve that elected the first Doge. Between 1041 and 1674, seven Doges were furnished by this family, and several of its members were men of note.—AMBROGIO C. was sent as ambassador from Venice to Persia, 1473—1477, and gave an account of his travels in his *Viaggi fatti da Vinetia, alla Tana, in Persia, in India, et in Constantinopoli* (Ven. 1487).—CARDINAL GASPARO C. distinguished himself as Venetian ambassador at the court of Charles V., and was papal legate at the diet of Ratisbon, 1541, where he displayed great moderation.—GIOVANNI C., born 1549, was one of the most famous painters of his time; he painted the Resurrection, in San Francisco di Paolo's, in Venice.—VINCENZO C., born 1577, had acquired, at the age of 26, such a fame for learning, that the magistrates of Padua, in order to secure him for their university, established an extraordinary professorship of Greek and Latin eloquence.

**CONTE'MPT**, against the crown's ecclesiastical supremacy, by assuming local ecclesiastical titles under the authority of the court of Rome, is forbidden under penalties by 10 Geo. IV. c. 7, s. 24, and by 14 and 15 Vict. c. 60.

**CONTEMPT**, against the sovereign's title. See PRÆMUNIRE.

**CONTEMPT OF COURT.** There is probably no country in which courts of law are not furnished with the means of vindicating their authority and preserving their dignity by calling in the aid of the executive, in certain circumstances, without the formalities usually attending a trial and sentence. Of this the simplest instance is where a judge orders the police to enforce silence, or to clear the court. Contempts by resisting the process of a court, are in England punished by Attachment (q. v.); contempts done in the face of the court, by directly obstructing its proceedings, may be visited with commitment and fine. Striking a supreme judge in the discharge of his duty, or even threatening him by drawing a weapon, or the like, has been an offence at common law in England of the highest kind since the times of the Anglo-Saxons; and in Scotland, it is a statutory offence, punishable either capitally or by very severe arbitrary pains (1593, c. 173; 1600, c. 4). See JUDGE. In the latter country, minor contempts are punishable arbitrarily, either *ex proprio motu* of the court, where the offence has come under its immediate observation, or by a summary complaint at the instance of the public prosecutor, where, though not committed in the immediate presence of the court, it has relation to a matter which is, or has been recently, in dependence before it.

**CONTEMPT OF PARLIAMENT.** See Parliamentary Privilege.

**CONTI, House of**, a branch of the House of Conde (q. v.). Armand de Bourbon, first prince of C., and brother of the great Conde, was born at Paris in 1629. He took his title from the little town of Conti, situated five leagues from Amiens. Of a feeble constitution and deformed shape, he was early destined for the church, but the fame of his brother inspired him with military ardour. He commenced his martial career as the opponent of his brother, but soon entered into alliance with him. After 1657, he retired from the world, and gave himself up, without reserve, to devotion. He died at Pezenas in 1666.—Louis Armand, Prince de Conti, Comte de Pezenas, and peer of France, eldest son of the preceding, was born in 1661. After a short career in arms, he died of small-pox at Fontainbleau, 5th November 1685. He left no children, and was succeeded by his brother Francois Louis, Prince de la Roche-sur-Yon et de Conti, who was born at Paris in 1664. This was the most remarkable member of the family. Educated under the eyes of the great Conde, he early conceived a passion for bearing arms. His first campaign was made in Hungary, where he distinguished himself; but having fallen into disgrace with the court, he was banished to Chantilly, with strict orders not to leave it. The great Conde, before his death, persuaded Louis XIV. to pardon him. Subsequently, C. served under the Duc de Luxembourg, who was warmly attached to him, and took a brilliant part in the victories of Steinkirk and Neerwinden. In 1697, he narrowly escaped being made king of Poland. On his return to France, he was still coldly received by Louis, who, however, was at last forced by disaster to employ him. He received the command of the army of Flanders in 1709, but died on the 22d February of the same year. Massillon pronounced his funeral oration. Saint-Simon, in his celebrated *Mémoires*, thus speaks of him: 'He was the delight of armies, the divinity of the people, the hero of officers, the darling of parliament, and the admiration of the most learned savans.'—The last member of the House of C. was Louis Francois Joseph, born 1734, died in Spain 1807.

**CO'NTINENT.** Though no mathematical distinction has ever been drawn between a C. and an island, the usage of language has generally recognised five great masses or divisions of land as continents—Europe, Asia, Africa, America, and Australia. Europe, Asia, and Africa form properly one great C., the only one known to the ancients; the second was discovered by Columbus; and the third made its appearance at the antipodes of Europe in the beginning of the 17th century. The existence of an antarctic C. has not yet been satisfactorily established. The apparent irregularity in the shape of the continents disappears on nearer examination, and certain uniformities become apparent, the causes of which have long been subjects of speculation. Bacon remarked, that the continents were pointed towards the south polar sea, and presented broad conformations toward the north. J. R. Forster followed up this remark by the generalisation, that these southern points are the ends of mountain-ranges, which are continued northwards; and that at the east side of these promontories there are always larger or smaller archipelagos of islands, while the west side of the continents is indented with large bays.

Not only have attempts been made to reduce the horizontal outlines of the continents to rule, but their vertical dimensions have been examined with the same view. Observation had been confined to ascertaining the heights of individual summits, until Alexander von Humboldt enriched physical geography with a new numerical element, by endeavouring to determine the mean height of continents—i. e., the elevation of the centre of gravity of their mass. He estimated the mean height of Europe at 103 toises (a toise is about 6 feet 6 inches), of North America at 117, of South America at 177, and of Asia at 180 toises. Laplace had calculated the mean height of all the continents at 1000 metres; Humboldt found this too great by two-thirds, and gives the height of the centre of gravity of all the continents, except Africa, above the sea-level at 307 metres, or 1007 feet.

**CONTINE'NTAL SYSTEM; BERLIN DECREE; ORDERS IN COUNCIL.** The C. S. was the name given to Napoleon's plan for shutting England out from all connection with the continent of Europe, and thus compelling her at least to acknowledge the maritime law established at the peace of Utrecht. See Neutrality. This system began with Napoleon's famous 'Berlin Decree' of November 21, 1806, which declared the British islands in a state of blockade, and prohibited all commerce and correspondence with them; every Englishman found in a country occupied by French troops or by their allies was declared a prisoner of war; all merchandise belonging to an Englishman, lawful prize; and all trade in English goods entirely prohibited. No ship coming direct from England, or from a British colony, was allowed to enter any port; and any ship seeking by false declarations to evade the regulation, was confiscated with its cargo as if British property.

England was not long in making reprisals. By an 'order in council,' issued January 7, 1807, all neutral vessels were prohibited from entering any port belonging to France or her allies, or under her control. Every neutral vessel violating this order was to be confiscated with its cargo. Still more oppressive for neutral commerce was a second order in council of November 11, 1807, by which all harbours and places of France, and her allies in Europe and the colonies, as well as of every country with which England was at war, and from which the English flag was excluded, were placed under the same restrictions as if strictly blockaded. These orders were followed by reprisals on the French side. By the Milan Decree of December 17, 1807, strengthened by a second of January 11, 1808, from the Tuileries, any vessel, of whatever nation, that had been searched by an English ship, had submitted to be sent on a voyage to England, or paid any duty to the English government, was to be declared *denationalised*, and treated as English. In order the more effectually to annihilate English commerce, there appeared, August 3, 1810, the tariff of Trianon for colonial goods; this was extended by a decree of 12th September, and on the 18th October followed the Decree of Fontainbleau, ordering the burning of all English goods; an order which was to be carried out with more or less modification in all countries connected with France.

The consequence of the C. S. was undoubtedly the springing up on the continent of many branches of manufacture to the prejudice of England; on the other hand, the price of foreign produce rose to an extraordinary height on the continent, enabling a few commercial men to make fortunes, but sensibly affecting the daily comfort of the middle classes. This violent interruption of human intercourse and sociability was an unnatural condition, which could not last long, and could only serve to strengthen the hatred of Europe against French tyranny. Accordingly, with the breaking up of Napoleon's power, the C. S. fell to the ground.

**CONTI'NGENCY**, in Law, an event, the occurrence of which, though uncertain, is sufficiently probable to be provided for. Thus, contingent debts, by the law of Scotland, are taken into account in estimating the claims on the estate of a bankrupt, though a contingent creditor is not entitled to concur in a petition for sequestration, or to vote in the election of a trustee, until his claim shall be valued.

**CONTI'NGENT** is the quota of troops furnished to the common army by each member of an alliance or confederation of states. It is especially applied to the proportions contributed by the several German states to the army of the confederation. See Germany.

**CONTI'NUED FRACTIONS.** See Fractions.

**CONTO'RNIATE** (Ital. *contorno*, Fr. *contour*), a term applied to a class of antique medals, which have a deep line cut round the edge, like a furrow.

**CONTO'RTED STRATA** are beds which are bent and twisted, so that in a section their edges would be seen to follow crooked and curved lines, often doubling back and running altogether out of their former course. An account of extensive C. S. will be found under the article Appalachians.

**CO'NTRA**, a term in Music, meaning opposite, lower, and applied to the alto and tenor parts when they form the lowest part in the harmony. When a part lower than the usual bass is employed, it is called contra-basso. C. is also used in organ-building, to indicate that a certain stop, or register of pipes, is an octave lower than the usual pitch.

**CONTRA BASS**, or **VIOLO'NE**, the largest species of stringed instrument, commonly called the double bass. In Britain, this class of instrument has three strings, the lowest being A, a minor third below the low C of the violoncello; the next is a fourth above, viz., D; and the highest is G, a fourth above D. This manner of stringing is defective, as all the great masters have written for the C. B. down to E, for which reason the German instruments have all four strings, the lowest a fourth below our low A. C. B. is also the name of an organ stop of 16 feet pitch.

**CO'NTRABAND OF WAR** (Lat. *contra bannum*, against the proclamation), is a name applied to certain commodities, or the rules relating to them, during hostilities between states which acknowledge what are called the laws of nations. One such law is, that neutral nations must not carry on, for the advantage of either of the belligerent powers, any branches of commerce from which they are excluded in time of peace. Another is, that the name of C. of W. shall be given to such articles as pertain to military or naval warfare—guns, ammunition, and stores of all kinds. Unless there are special treaties, defining exactly what articles are C. of W., the interpretation of this law often leads to much embarrassment. Another law insisted on by England during the last great war was, that each belligerent shall have a right to visit and examine neutral ships, to see whether they carry any articles which are C. of W., and which seem likely to be intended for the enemy. A neutral state may carry on ordinary trade with either belligerent, except when prevented by blockade (see Blockade); but the ships, according to the above rules, must not contain articles C. of W.; nor must a conterminous land frontier be crossed by such commodities. If a merchant evades these rules, he does so at his own risk; his merchandise may be seized, and his own government will not protect him. By the law and practice of nations, it is for the Admiralty Court of the capturing power to decide what is or what is not contraband of war. Upon such questions it is the province of this tribunal to adjudicate; and from its final judgment there is no appeal. At various times, discussions have arisen whether corn, hay, or coal, can ever be included in the list of articles C. of W.; they are obviously articles of peaceful commerce, but they are also essential to the maintenance of an army, and sometimes a supply would give one belligerent a great advantage over the other. Especially is this the case in reference to coal, in the present age of war-steamers.—Contraband in commerce depends upon the special laws of each country. See Smuggling.

**CO'NTRACT.** For a statement of the principles on which contracts in general are founded, see Consent.

**CONTRA'CTIONS.** The wish or necessity of economising labour and parchment, led the scribes of the middle ages to use a great many abbreviations or C. in their manuscripts. These C. were transplanted into the first printed books; and more recently they have been reproduced in many works, as well in this country as on the continent, where it was thought desirable that the modern print should represent as nearly as possible all the peculiarities of the ancient manuscript. A knowledge of C., therefore, is indispensable not only to readers of old writings, but to readers of the printed books of the 15th, the 16th, and the earlier part of the 17th centuries, and to all who desire to avail themselves of the vast stores of historical and archæological materials accumulated in the rolls and records published by the governments of Great Britain, France, and other countries.

C. may be divided into six classes: 1. C., properly so called; 2. C. by elision or suspension; 3. C. by writing a smaller letter above the word contracted; 4. C. by running two or more letters into one character; 5. C. by symbols representing syllables or words; 6. C. by initial letters.

1. *Of C., properly so called*, there are three great kinds: (I.) A straight line over a letter denotes the omission of an *m* or an *n* after it, as in the following examples:

| | |
|---|---|
| ā | ānus, *annus;* quā, *quam;* faciāt, *faciant;* tenendā, *tenendam.* |
| ē | faciēt, *facient;* regē, *regem;* serviētibus, *servientibus.* |
| ī | statī, *statim;* ī, *in;* īmediate, *immediate.* |
| m̄ | om̄es, *omnes;* om̄ia, *omnia;* om̄i, *omni.* |
| ō | nō, *non;* cōmunis, *communis;* hōines, *homines;* cōcessa, *concessa.* |
| ū | hūc, *hunc;* volūtatē, *voluntatem;* festū, *festum;* hōiū, *hominum.* |

(II.) A crooked or circumflex line over or through a letter signifies that one or more letters are omitted after it—occasionally both before and after it—thus:

| | |
|---|---|
| ã | cã, *causa;* añ, *ante;* aña, *antea;* añlo, *angelo;* miãm, *misericordiam.* |

| | |
|---|---|
| ƀ | ƀe, *beate;* ƀi, *beati;* noƀ, *nobis;* liƀtatē, *libertatem.* |
| ƀƀ | aƀƀe, *abbate;* aƀƀ, *abbas.* |
| c̃ | dc̃us, *dictus;* ecc̃ia, *ecclesia;* sc̃a, *sancta.* |
| đ | đ, *de;* đ, *dans;* đo, *deo;* dñs, *dominus;* dñi, *domini;* eƀđa, *ebdomada.* |
| Đ | *David;* ĐĐ, *David.* |
| ẽ | ẽe, *esse;* ẽ, *est.* |
| f | fr, *frater.* |
| g̃ | mag̃ro, *magistro;* mg̃r, *magister;* mag̃, *magis.* |
| ħ | ħeat, *habeat;* ħui, *habui;* ħnt, *habent.* |
| ĩ | aĩa, *anima;* aĩal, *animal;* aĩā, *animam;* feĩa, *femina;* mĩe, *minime;* oĩo, *omnino.* |
| ꝁ | ꝁmus, *karissimus;* ꝁmi, *karissimi.* |
| ł | fił, *filio;* vł, *vel;* łia, *licentia;* ł, *lege;* łr, *libenter;* płał, *pluralis.* |
| łł | bałłis, *ballivis;* sigiłł, *sigillo;* Wiłłmo, *Willelmo.* |
| m̃ | om̃es, *omnes;* hom̃ibus, *hominibus;* com̃, *comite;* m̃s, *meus;* tm̃, *tantum, tam, tamen.* |
| ñ | dñs, *dominus;* ñr, *noster;* ñro, *nostro;* ñdū, *nondum;* tñ, *tandem, tamen;* sñiā, *senten-ciam.* |
| õ | õia, *omnia;* õro, *oratio;* rõis, *rationis.* |
| p̃ | ep̃is, *episcopis;* p̃p̃, *papa;* ap̃lice, *apostolice;* p̃r, *pater;* tp̃s, *tempus.* |
| q̃ | q̃stio, *questio;* extorq̃re, *extorquere.* |
| r̃ | gr̃a, *gratia;* nr̃m, *nostrum;* pr̃, *pater;* pr̃na, *paterna.* |
| s̃ | s̃btus, *subtus;* s̃, *sum, sunt;* s̃s, *suis.* |
| t̃ | dict̃, *dictus, dicti, dicto, dictum;* salt̃, *salutem;* it̃m, *item;* t̃c, *tunc.* |
| ũ | aũ, *autem;* ũre, *uestre;* ũba, *uerba.* |
| ṽ | ṽr, *vester;* ṽris, *vestris.* |

(III.) The sign ͛ over a letter shews that *er*—or occasionally *re*—is omitted after it, as:

| | |
|---|---|
| b͛ | hab͛e, *habere.* |
| c͛ | c͛to, *certo;* exerc͛e, *exercere;* fec͛it, *fecerit.* |
| d͛ | possid͛e, *possidere;* evad͛e, *evadere.* |
| f͛ | f͛vida, *fervida;* pref͛re, *preferre.* |
| g͛ | infring͛e, *infringere;* eg͛ssum, *egressum;* transg͛essor, *transgressor.* |
| h͛ | h͛es, *heres;* coh͛cioni, *cohercioni.* |
| l͛ | cl͛icus, *clericus;* expell͛e, *expellere.* |
| m͛ | am͛cietur, *amercietur;* m͛cis, *mercis;* m͛cator, *mercator.* |
| n͛ | on͛a, *onera;* gen͛osi, *generosi;* itin͛e, *itinere.* |
| r͛ | inquir͛e, *inquirere.* |
| s͛ | s͛vus, *servus;* s͛vicium, *servicium.* |
| t͛ | cet͛a, *cetera;* t͛ram, *terram;* t͛s, *tres;* t͛r, *ter.* |
| u͛ | fu͛it, *fuerit;* ħu͛it, *habuerit.* |
| v͛ | v͛bo, *verbo;* ov͛tes, *overtes;* rev͛t͛e, *revertere.* |
| x͛ | ex͛citum, *exercitum.* |

2. *In C. by elision or suspension*, the word is not fully written, the want of the terminating letters being denoted by the marks ꝰ, or ’, or .; thus:

| | |
|---|---|
| assꝰ | *assisa.* |
| test’ | *teste.* |
| dat. | *datum.* |
| temp. | *tempore.* |

3. *C. by writing a smaller letter above the word contracted.*—If the letter so written be a vowel, it denotes the omission of a consonant; if a consonant, the omission of a vowel. Occasionally the omission extends to two or more letters, whether vowels or consonants.

| | |
|---|---|
| q$^{a}$m | *quam.* |
| g$^{a}$tia | *gratia.* |
| occ$^{a}$one | *occasione.* |
| p$^{i}$mis | *primis.* |
| m$^{i}$ | *mihi.* |
| n$^{i}$ | *nisi.* |
| s$^{i}$ | *sibi.* |
| imp$^{i}$sonet$^{r}$ | *imprisonetur.* |
| m$^{o}$ | *millesimo, modo.* |
| int$^{o}$itus | *introitus.* |
| mag$^{o}$ | *magistro.* |
| m$^{o}$asteriū | *monasterium.* |
| p$^{r}$sas | *prisas.* |
| fig$^{r}$a | *figura.* |
| c$^{u}$cis | *crucis.* |

4. *Of C. by running two or more letters into one character*, the diphthongs *æ* and *œ*, and the sign *&* for *et*, are familiar examples. The modern *&* has often, in old writings and books, the form of ȼ, and ⁊, and ꝉ. A circumflex over this last character ꝉ̃ represents *etiam.*

5. *C. by symbols representing syllables or words.*—The most common of these are shewn in the following table:

| | |
|---|---|
| c͂o | *cio;* invenc͂oe, *invencione.* |
| ꝯ | *con* or *com;* ꝯuentus, *conuentus;* ꝯpellere, *compellere.* |
| p͛ | *pre;* p͛ oculis, *pre oculis;* p͛stito, *prestito.* |
| ꝑ | *per, par,* and *por;* ꝑpetuo, *perpetuo;* ꝑatus, *paratus;* corꝑum, *corporum;* ꝑn$^{a}$, *persona.* |
| ꝓ | *pro;* ꝓprio, *proprio;* ꝓ ꝑpetuo, *pro perpetuo.* |
| qꝫ | *que;* absqꝫ, *absque.* |
| ꝝ | *rum;* s͛uoꝝ, *seruorum.* |
| ſ͛ | *ser;* ſ͛uicio, *seruicio.* |
| ʒ | *us* and *et;* quibʒ, *quibus;* quilibʒ, *quilibet;* sʒ, *set* (*sed*). |
| $^{z}$ | *ur;* audit$^{z}$is, *auditurus;* vis$^{z}$is, *visuris.* |
| ꝰ | *us, os,* and *ost;* hujꝰ, *hujus;* dedimꝰ, *dedimus;* pꝰ, *post;* pꝰt, *post;* pꝰtea, *postea.* |
| ȥ | *tz;* fiȥ, *fitz.* |
| ꝭ | *is;* Scotꝭ, *Scottis;* lordꝭ, *lordis.* |
| ∻ | *est.* |
| ẽ | *est.* |
| g$^{z}$ | *igitur.* |
| g$^{o}$ | *ergo.* |
| h$^{z}$ | *hic.* |
| ħ | *hec* or *hoc.* |
| ł | *vel.* |
| ñ | *non.* |
| q̃ | *que.* |
| ꝗ | *quod.* |
| ꝗ$^{a}$ | *quam.* |
| q$^{z}$ | *quia.* |

6. *Of the more common C. by initials*, a list has already been given in this work, under ABBREVIATIONS (q.v.). In this way of writing, a whole sentence may be expressed without so much as one word being written at length, as in the well-known epistolary form S.V.B.E.E.Q.V.; that is, *Si vales, bene est, ego quidem valeo.* Among the initials used in

old writings and books, it will suffice here to mention the following:

| | |
|---|---|
| A. | Alexander, Alanus, Arthurus. |
| B. | Benedictus, Bernardus, Bonifacius. |
| B.M.V. | Beata Maria Virgo. |
| B.P. | Beatus Paulus, *or* Petrus. |
| B.V. | Bene vale. |
| C.TT. | Cardinalis Tituli. |
| D. | David, Durandus, Duncanus. |
| D.N.PP. | Dominus Noster Papa. |
| E.R. | Ecclesia Romana. |
| F.F.F. | Fiat, Fiat, Fiat. |
| G. | Gulielmus, Gilbertus, Guido, Georgius. |
| G.G. | Gregorius. |
| I.C. or I.X. | Jesus Christus. |
| I.D.N. | In Dei Nomine. |
| J. | Johannes, Jacobus, Julietta, Josephus. |
| M. | Malcolmus, Martinus, Matilda, Maria. |
| N.E.R. | Notarius Ecclesiæ Romanæ. |
| O.S.B. | Ordinis Sancti Benedicti. |
| P.S.R.I. | Princeps Sacri Romani Imperii. |
| R. | Robertus, Rolandus, Ricardus. |
| R.P.D. | Reverendissime Pater Domine. |
| S. | Symon, Samuel, Siwardus. |
| S.C.M. | Sacra Cæsarea Majestas. |
| S.D. | Salutem Dicit. |
| S.D.N.R. | Supremus Dominus Noster Rex. |
| S.M.E. | Sancta Mater Ecclesia. |
| S.P. | Sacri Palatii. |
| S.R.E. | Sacra Romana Ecclesia. |
| S.V. | Sanctitas Vestra. |
| T. | Thomas, Turgodus, Thoraldus. |
| V.R.P. | Vestra Reverendissima Paternitas. |
| V.S. | Vestræ Sanctitatis. |
| W. | Willelmus, Walterus, Wido. |

Doubling an initial, shews that it is to be taken in the plural sense, as PP. for Papæ, TT. for Tituli, MSS. for Manuscripts.

*C. Corrupted.*—The Anglo-Saxon þ, denoting *th*, has been corrupted into *y*; whence y$^{e}$ is put for *the*, y$^{r}$ for *their*, y$^{n}$ for *then*. In Scotland, the numerals j$^{m}$ vj$^{c}$, that is, 1600, have been corrupted into the unmeaning word jaj, or jajc.

*C. Exemplified.*—A sentence of the famous Declaration of Scottish Independence of 1320 is here given, with the contractions of the original (now in the Register House at Edinburgh); the same sentence with the contracted words written at length being placed by its side.

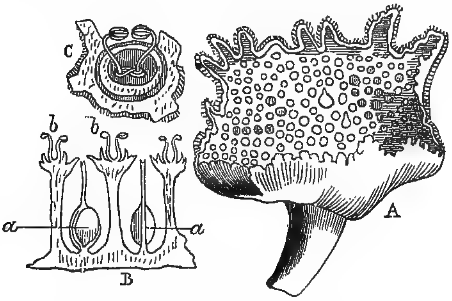
| Original. | Contracted words at length. |
|---|---|
| Quia q$^{a}$diu Centū viui | Quia quamdiu Centum viui |
| remanserint / nūcq$^{a}$ Ang- | remanserint, nuncquam |
| łoꝝ dñio aliq$^{a}$tenꝰ volumꝰ | Anglorum dominio aliqua- |
| subiugari / Non enī ꝑpt | tenus volumus subiugari: |
| gl̃iam / diuicias aut hono- | non enim propter gloriam, |
| res pugnamꝰ / set ꝑpt lib̃- | diuicias, aut honores pug- |
| tatem solūmodo / q$^{a}$m nemo | namus, set propter liber- |
| bonꝰ / n$^{i}$ simul cū vita | tatem solummodo, quam |
| am$^{t}$tit. | nemo bonus nisi simul cum |
| | vita amittit. |

That is, 'So long as a hundred of us remain in life, we will never be brought under the dominion of the English; for it is not for glory, or riches, or honours that we fight, but for freedom alone, which no good man will part with, except with his life.'

Collections of C. have been engraved in *fac-simile* in several works, among which may be enumerated Baring's *Clavis Diplomatica*, Hanov. 1737 and 1754; Anderson's *Diplomata Scotiæ*, Edin. 1739; Walther's *Lexicon Diplomaticum*, Gotting. 1745; the *Nouveau Traité de Diplomatique*, Paris, 1750—1765, one of the many noble works of the Benedictines of St Maur; Lemoine's *Diplomatique Pratique*, Metz, 1765; Trombelli's *L'Arte di conoscere l'età de' codici Latini ed Italiani*, Bologn. 1756 and 1778; M. Nat. de Wailly's *Éléments de Paléographie*, Paris, 1838; M. L. Alph. Chassant's *Paléographie*, Paris, 1839 and 1854, and his *Dictionnaire des Abréviations*, Evreux, 1846.

**CONTRAVE'NTION**, in the law of Scotland, any act done in violation of a legal condition or obligation. The term is most frequently applied: 1. To an act done by an heir of entail, in opposition to the provisions of the deed; 2. To an act of violence or molestation, in opposition to law-borrows (q. v.). Stair, i. 9, s. 30, and iv. 48.

**CONTRAYE'RVA**, a medicine once in much repute against low fevers, and as a mild stimulant and diaphoretic, and still used in some countries, although not much in Britain, consists of the root-stocks (rhizomes) of different species of *Dorstenia*, a tropical American plant of the natural order *Moraceæ*. The genus is remarkable for the plane receptacle in which the numerous small flowers are fixed; the male flowers in superficial depressions, the female flowers in deep sockets. The flowers have neither calyx nor corolla. The fruit consists of *achenia*, imbedded in the fleshy receptacle from which they are projected by elastic force when ripe. *D. Contrayerva* is a perennial plant, with palmate leaves, and somewhat quadrangular receptacles. Its root-stock is knotty, 1—2 inches long, about half an inch thick, reddish-brown, pale within, sending out on all sides many slender fibres (roots), which are generally loaded with small brown knots. It has a peculiar aromatic, overpowering smell, and a somewhat astringent, warm, bitterish taste. It keeps badly. It contains so much mucilage, that a decoction of it will not pass through a filter.—*D. Brasiliensis*, a stemless species, with oblong, heart-shaped leaves and a circular receptacle, a native of the West Indies and Brazil, possesses similar properties, but is said to be more energetic, and furnishes the C. of British commerce. Other species possess properties somewhat similar. They have been also represented as efficacious against serpent-bites, and hence the name C., a *counter-poison*.



Dorstenia Contrayerva:

A, entire receptacle; B, section of receptacle. *a*, female flowers; *b*, male flowers; *c*, male flower in its superficial hollow.

**CON'TUMACY**, a Scotch law-term, which, in one sense, is equivalent to non-appearance in England (see Decree in Absence; Default); but which is sometimes used in the wider sense of disobedience to any judicial order. In a criminal process, C. is punished by a sentence of fugitation; in a civil process, its only consequence is that the case will be proceeded with, and decree pronounced against the contumacious defender.

**CONVALLA'RIA.** See Lily of the Valley.

**CO'NVENT.** See Monastery.

**CONVE'NTICLE** (Lat. *conventiculum*, a diminutive of *conventus*), originally meant a cabal among the monks of a monastery, formed to secure the election of a favourite as abbot. The word consequently fell into disrepute. It was first given as an appellation of reproach to the assemblies of Wickliffe's followers, and was afterwards applied to the meetings of the English and Scottish nonconformists. Severe statutes were often passed for the suppression of these conventicles. See Toleration Act, Test Act.

**CONVE'NTION,** National. See National Convention.

**CONVENTION OF ROYAL BURGHS,** in Scotland. The burgh system of Scotland is very ancient (see Burgh), but it was by stat. 1487, c. 111, that the royal burghs of Scotland were first ordered to hold an annual meeting by commissioners, at what is now the unimportant town of Inverkeithing, where 'the welfare of merchandise, the gude rule and statutes for the common profit of burrows,' should be discussed, 'and which should provide for remeid upon the skaith and injuries sustained within the burrows.' This convention is conjectured by Mr Burton to have taken the place of the more ancient 'court of the four burghs'—Edinburgh, Stirling, Berwick, and Roxburgh. The powers conferred by this act, which were renewed by later statutes, are still in force, and in virtue of them the C. of R. B. meets annually in Edinburgh on the second Tuesday of July. This court had a partial jurisdiction in questions as to the general regulation of trade, along with legislative authority over the constitutions of the burghs, which, previously to the passing of the Burgh Reform Act, included a right to adjust their 'sets' (q. v.). Its operations are now almost entirely limited to discussing measures connected with trade, for which it may be proposed to apply to parliament. In this respect, it acts in the character of something like a general chamber of commerce (q. v.).

**CONVENTION PARLIAMENT.** It is a branch of the royal prerogative, that no parliament shall be convened by its own authority, or by any other authority than that of the sovereign. Where the crown is in abeyance, this prerogative cannot of course be exercised, and the expedient of Convention Parliaments has been resorted to, the enactments of which shall afterwards be ratified by a parliament summoned in accordance with the provisions of the constitution. The C. P. which restored Charles II. to the throne met above a month before his return, and was afterwards declared to be a good parliament, notwithstanding the defect of the king's writs (13 Car. II. c. 7 and c. 14). In like manner, at the revolution of 1688, the Lords and Commons, on the summons of the Prince of Orange, met in Convention, and disposed of the crown and kingdom, and this convention was subsequently declared (1 Will. and Mary, st. 1, c. 1) to be really the two Houses of Parliament, notwithstanding the want of writs and other defects of form. Under the name of Convention, there also took place a meeting of the Estates of Scotland, called by the Prince of Orange on the same occasion. This meeting commenced on the 14th of March 1689, and was turned into a parliament on the 5th of June thereafter. The principal act of the Convention was to settle the Scottish crown upon William and Mary. After these precedents, we are perhaps almost entitled to regard the meeting of a C. P. as the constitutional mode in which the general will of England expresses itself on such questions as cannot be constitutionally discussed in parliament—e. g., a change of the reigning dynasty.

**CONVE'NTIONAL,** in Art, is that which is in accordance, not with the absolute principles of beauty in form and colour, but with the opinions and sentiments with reference to forms and colours, which chance to prevail at a particular time, in a particular country, or social class. Conventionality in art holds the same relation to the beautiful that conventionality in morals does to the good, or in speculative opinion to the true.

**CONVERGING,** or **CONVERGENT,** is applied, in Geometry, to straight lines that meet or tend to meet in a point; looked at in a direction from the point, they are *divergent*, or separating. C. and divergent are often used in reference to rays of light. See Catoptrics. In Algebra, the term convergent is applied, in a loose way, to any infinite series the terms of which go on diminishing; while a series is called divergent when its terms continually increase. Strictly, however, a C. series is one whose terms diminish in such a way that no number of them added together will be as great as a certain given number. Thus, however far we extend the series, $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8}$, &c., the sum will never amount to 2, though always approaching nearer to it. But the series, $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} +$ &c., has no such limit, and is therefore not convergent in this sense.

**CONVERSA'NO,** a town of Naples, in the province of Bari, about 19 miles south-east of the city of that name. It is pleasantly situated on a hill in a fertile wine, oil, almond, and cotton producing district. It has a cathedral and several convents. Pop. 9000.

**CO'NVERSE** and **CONVE'RSION** are terms in Logic, signifying that one proposition is formed from another by interchanging the subject and predicate: as, 'Every A is B;' the C. of which is, 'Every B is A.' This example is termed a case of *simple* conversion; besides which, however, logicians recognise two other kinds of conversion—viz., *limited* conversion, and conversion by *contraposition*. The former may be exemplified thus: 'Every A is B;' the limited C. of which is, '*Some* Bs are As;' and the latter thus: 'Some A is not B;' which, converted by contraposition, is, 'Something that is not B is A;' 'Some men are not wise; some beings that are not wise are men.' Of these logical converses, the second and third are *necessarily* true, but not the first. When we say, 'Every A is B,' the reader might at first sight conclude that 'Every B is A' also; but if, instead of these letters, to which he probably attaches no meaning, he employ terms denoting objects with which he is familiar, he will see that a simple C. may be very far from the truth. Thus, 'Every penny is a coin,' has for its simple C. 'Every coin is a penny.' The reason why a simple C. is not necessarily true is, that in such a proposition as 'Every A is B,' the subject 'A' is—to speak logically—universally distributed, whereas the predicate 'B' is not. If it were, the proposition would read as follows: 'Every A is *every* B;' the simple C. of which, 'Every B is every A,' would be true.

**CO'NVEX.** See Concave.

**CONVEY'ANCE,** in Law, is the deed or writing by which property is conveyed or transferred from one person to another. The term, though strictly applicable, is not generally applied to the act of transferring personal, or, as it is called in Scotland, movable property. As regards real or heritable property, the more special nature of a C., and the consequent duties of the conveyancer, in so far as they fall within the scope of this work, will be explained under separate heads. See, for England, Fee, Freehold, Copyhold, Leasehold, Mortgage, Chattels, Bill of Sale, Assignment, Feoffment, Deed, Common Form, Grant, Trust, Settlement, Uses, &c.; and for Scotland, Feu, Superior, Vassal, Ward-holding, Mortification, Feu-farm, Blench-holding, Burgage-holding, Charter, Sasine, Disposition. A statement of the general nature of a C., and of the feudal system, with which the conveyancing of many of the countries of Europe is still so intimately connected, will be given under Conveyancing.

**CONVEY'ANCER** is a person who practises the art of preparing the deeds or writings used for the conveyance or transference of property from one person to another. Conveyancers in England are generally barristers, who in most instances belong to the Equity bar. There is also a special class of practitioners, known by the name of conveyancers, who are members of the Inns of Court, though not called to the bar. These must take out an annual certificate. But although most deeds respecting real estate are drawn by conveyancers, there is no rule against their being drawn by an attorney or solicitor, if he chooses to take the risk, or indeed by any party.

**CONVEY'ANCING** is the art of preparing the deeds or instruments used for the transference of property from one person to another. Such writings form the title or evidence of the right of the person possessing or claiming possession of property; and it is of the greatest importance that the conveyancer employed to prepare them, should be possessed of a competent knowledge of the law as applicable to such deeds, and have the skill required to frame them in such a form as clearly to express and attain the object intended. In the earliest stage of society, there was no call for the profession of a conveyancer; property was held in right of occupancy, without any written title, and was also conveyed from one to another without writing, the new owner being usually put in possession in presence of witnesses called for the purpose, by some symbolical form, such as the delivery of earth and stone to represent the land, a wand to represent wood, grass and corn to represent tithes, and other appropriate symbols to represent mills, fishings, or other kinds of property.

In the earlier period of the history of the Jews, the symbolical mode of changing the ownership of property was curious. 'Now this was the manner *in former time* in Israel concerning redeeming and concerning changing, for to confirm all things: a man plucked off his shoe, and gave it to his neighbour: and this was a testimony in Israel' (Ruth iv. 7). In later times, the Jews appear to have had a much more artistic system of C., making use of all the safeguards that are used in modern times—viz., writing, witnesses, subscribing, sealing, and recording the documents. There is a very distinct account of a Jewish conveyance in the later period in Jeremiah xxxii. 9—12: 'And I bought the field of Hanameel, and weighed him the money. And I subscribed the evidence, and sealed it, and took witnesses. So I took the evidence of the purchase, both that which was sealed according to the law and custom, and that which was open: and I gave the evidence of the purchase unto Baruch, in the sight of Hanameel [the seller], and in the presence of the witnesses that subscribed the book of the purchase, before all the Jews that sat in the court of the prison.'

The Romans made no distinction in principle between real and personal or movable and immovable property, in their conveyancing. Each kind of property was held free of any superior. Their deeds were therefore simple, not requiring any reservation or declaration of the superior's rights. They had public registers in which conveyances were recorded. After the invasion of the southern by the northern nations, the feudal system spread over nearly the whole of Europe, and C. was regulated in accordance with it; the rights of the superior and the rights of the vassal or proprietor being carefully distinguished. The Leges Barbarorum, contained in the Burgundian Code, and the Code of the Longobardi, embody the older feudal uses, from which the modern are derived. In the 7th c., a work of peculiar interest to the conveyancer was compiled by Marculfus, a monk, containing the germs of modern conveyancing. It is in substance a book of styles or forms of deeds, partly Roman and partly feudal. The genius of the system of land-rights derived from the barbarians was to concentrate the property of land, for the sake of individual power; while the Roman laws and customs tended in the opposite direction, for they treated land in regard to succession like movables, as the French now do, dividing it among the whole members of a family. Alienation by sale or gift was freely permitted, a power long denied by the feudal rules. Indeed, feus or grants were originally revocable by the superior, and did not become hereditary till the time of Charlemagne.

Among the ancient Goths and Swedes, the conveyance of land was made in the presence of witnesses, who extended the cloak of the buyer, while the seller threw a clod of the land into it, as a symbol of the transference of possession. Among the Saxons, the delivery of a turf by the seller to the buyer was necessary. Written titles were, however, introduced at an early period, and at first were short and simple in form, but increased in length and complexity as civilisation advanced, containing various conditions, provisions, and limitations, so that the art of the conveyancer became both a difficult and laborious one. He had not only to prepare the appropriate form of conveyance, but to examine the prior writings forming the title to the property, in order to judge whether they were in proper form and valid. As a general rule, a written title is now essential to the possession of real property in civilised communities; and if there is no written title, the property falls to the crown or state. In the Roman empire, extending over the greater part of Europe, the system of land-rights was allodial—that is, the lands were held independent of any superior. After the irruption of the northern nations into Italy, the feudal system was introduced, by which the proprietor has only a limited right under a superior. The introduction of the feudal system tended to complicate written titles to land very much, as not only had the rights of the grantee or vassal to be expressed and defined, but those of the granter as overlord or superior, also. In the present century, again, the tendency is towards simplicity; and in France, the feudal system has been superseded by the Code Napoleon. In Great Britain and other countries still retaining the feudal system, the forms of C. have been much shortened and simplified. While the feudal system, on the one hand, increased the complexity of C., it ought not to be forgotten that, on the other hand, it greatly lessened the number of conveyances. Under the Roman law, real property descended equally to all the heirs of a deceased proprietor, each heir requiring a written title to his own share; while the genius of the feudal law was to concentrate property in the heads of families, and the eldest son inherited the whole real estate of his ancestor; and alienation, by gift or sale, was long denied to feudal proprietors.

Improvement in the science of law occasions improvement in conveyancing. Under the Roman empire, the art of C. had attained to much precision in the hands of the imperial notaries. After the fall of the empire, C. fell into the hands of ecclesiastical notaries; by them it was communicated to the conveyancers of the church, who performed the duties of the conveyancer for some centuries, till after the revival of letters, when the art again passed to laymen.

The feudal system does not seem to have been generally introduced into Great Britain till after the Conquest, though traces of it are to be found earlier. The inherent character of the feudal tenure is a grant of land made voluntarily by a king or leader, on the condition of the fidelity of the grantee and military service. While, on the one hand, the superior was a protector to the vassal in time of trouble; on the other hand, the vassal was exposed to the cupidity and rapacity of the superior, whose right to casualties or feudal incidents enabled him to oppress his vassals. The nature of these casualties or incidents will be explained under FINE, QUIT-RENT, HERIOT, COPYHOLD, ESCHEAT, WARDSHIP, MARRIAGE. One of the most curious of these incidents was that last mentioned. A male heir required the consent of his superior, and large fines were exacted for the consent. In the time of Charles I., the Earl of Warwick exacted £10,000—equal to a much larger sum now—for his consent to a lady-vassal marrying a husband in every respect suitable.

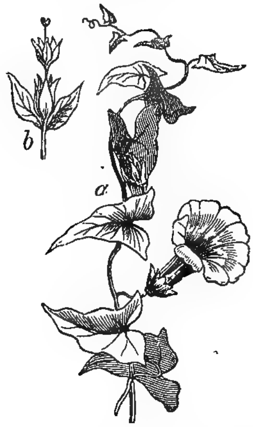
So long as feudal forms are retained, C. must be complex and expensive; and at present the opinion is becoming general, that the system ought to be abolished, and the allodial (q. v.) introduced in its stead. In this view, the superior's rights would require to be valued and paid for. Movable property is usually conveyed by delivery, but there are exceptions; thus, if it has been part of the bargain that the sale is to be completed by writing, the contract must be reduced to writing; and by statute, ships must be conveyed by a writing, which must be entered in the appropriate register, so as to shew any change of ownership.

**CO'NVICT** (from the Latin) means a person convicted of any criminal charge. The term came by custom to be applied to persons subject to punishment for the more serious class of offences, and of late its meaning has become almost entirely restricted to the class of criminals who used to be transported to the distant colonies of Britain. These criminals are now condemned to penal servitude for longer or shorter periods, and are usually spoken of as convicts under penal discipline, while offenders sentenced to short periods of detention in the ordinary jails are called prisoners. The convicts are confined in special C. establishments in different parts of the United Kingdom. The earlier history of the treatment of these criminals will be found under the head TRANSPORTATION. In the year 1840, the system of transportation to the chief penal colony, New South Wales, was suspended. Grave doubts had become prevalent as to the efficiency of the system, and all questions created by these doubts were solved by the refusal of the colonies to receive convicts, and the impossibility of disposing of them abroad, except in trifling numbers to the small district of Western Australia. It was thus necessary to solve the question, how these convicts could be treated at home in a manner consistent with the objects of punishment—the protection of the community, and the reformation of the offender to the extent to which that is practicable. Before this necessity occurred, considerable progress had been made in prison-discipline by arrangements which, without subjecting criminals to absolute silence or absolute solitude, separated them from the contaminating society of each other. It was naturally supposed that a system found beneficial for ordinary prisoners would suit convicts. But it was discovered that the discipline beneficially applied during a short period of imprisonment, could not be endured for a long period without physical and mental deterioration; and that the depression and anxiety created by their long sentences—sometimes for twenty years, and sometimes for life—made convicts break down under it within the period for which it could be quite easily endured by ordinary prisoners. It is a fixed principle of prison-discipline, that while punishment may be made to any extent disagreeable, it is never to be permitted, if possible, to injure either the body or the mind. It was found unsafe to subject male convicts to separate imprisonment for more than nine months; females, owing to some constitutional difference, are found to bear it without detriment for a few months longer. At the end of nine months, then, or a year, as the case may be, the C. is gradually, so far as is consistent with safe custody, brought back into the habits of the freer population. It is usual to call the early stage of their discipline the penal, and the later the reformatory. In the latter, they are associated under precautions and careful inspection, and are occupied in trades in which they may make their bread when free. Public works, such as the breakwater, quarries, and fortress at Portland, and the works at Chatham and Portsmouth, afford a valuable outlet for C. labour. In such establishments may be seen a thousand men or more, with hammers, mattocks, axes, and all descriptions of formidable tools, working under the eye of their warders as quietly and systematically as ordinary labourers. There are establishments where, as far as possible, the same system is administered to females—as at Buxton and Perth. The great hold by which the convicts are kept in order, is a series of rewards for good conduct, culminating in the greatest reward of all—a remission of part of the sentence. The results of the C. system have yet to be seen; but in the meantime it is undoubted that since this, the most formidable, part of the criminal population has been kept at home, crime has been decreasing.

The present C. establishments in the United Kingdom are:—In England, Portland, Portsmouth, and Chatham for males, in each of which there are public works; Pentonville, Parkhurst, and the Invalid Prisons at Lewes and Working, also for males; Millbank, for males and females; and Brixton and Fulham, for females. In Scotland, the C. department of the general prison at Perth is at present only occupied by females. In Ireland, Spike Island (with Forts Camden and Carlyle), Philipston, Smithfield, and Turk, for males; and Mountjoy, for males and females. The number of convicts in the several departments of the empire in 1860 were—England, 6934 males, and 1188 females; Scotland, 335 females; and in Ireland, 1187 males, and 444 females. There were at the same time 1800 male convicts employed at public works in Bermuda and Gibraltar, and about 500 on the old transporting system in South Australia.

**CONVOCA'TIONS** (from Lat. *convocare*, to call together) were originally synods of the clergy or the ancient ecclesiastical councils of the archbishop, but became incorporated into the English constitution of church and state, and endued with certain parliamentary privileges. Some writers distinguish between councils and C.—the former as being for spiritual purposes, and summoned without authority from the crown; the latter as being for civil purposes, and by command of the crown. The two, however, in process of time, especially after the Conquest, became gradually blended; C. made canons, and councils granted subsidies, and all distinction had disappeared before the Reformation. The circumstances attending the famous assembly at Northampton, 1282, in the reign of Edward I., helped to settle the form which C. have since assumed. In England, the provinces of Canterbury and York have each their convocation. Previous to the Reformation, these were sometimes convened into a *National* Synod; but since then, matters have usually been concluded in the C. of Canterbury, and transmitted to York for concurrence. A convocation consists of three elements—1. The archbishop; 2. The bishops; 3. The clergy of the second order. They originally met in one assembly, but since the beginning of the 14th c. the clergy in the province of Canterbury have retired into a distinct chamber, presided over by a *prolocutor*, with officers and journals of their own. These two bodies are called the Upper and Lower Houses. In the Convocation of York the same distinction exists, but on the rare occasions of their meeting, the business has been generally conducted in one assembly. The archbishop has the sole power of summoning, presiding, and proroguing; he has also a veto upon all measures. He cannot, however, summon without authority from the crown. The Upper House is the proper *locus synodi*, where the bishops have a right to sit and vote, and before the Reformation the mitred abbots had place there also. The Lower House consists of the lesser dignitaries, as deans and archdeacons, and the proctors sent by capitular bodies and by the parochial clergy. In Canterbury, the beneficed clergy only elect, and they send one proctor for each diocese; in York, all the clergy elect, and send one proctor for each archdeaconry. The Lower House deliberates on matters proposed by the archbishop; it may present petitions to the Upper House and state grievances, be with it in judicature on persons convened, and dissent from and so hinder the passing of any synodical act. The passing of subsidies in convocation ceased in 1665, and the records were destroyed in the fire of London in the following year. Meetings of convocation fell into abeyance from the political troubles caused by the Revolution of 1688. They have lately been revived in the southern province with considerable advantage to the church, but their action has been and is greatly restricted. In Ireland, the C. of the four provinces assembled at Dublin, all together, and were on the model of those in England. At the Union no provision was made with respect to this matter, and since then there has not been even a formal assembling of the Irish Convocation. An act of parliament was passed in 1663, for regulating the meetings of convocation in Scotland; but shortly after the Revolution of 1688, the Episcopal Church ceased to be the national church of that country; and ever since, the meetings of the Presbyterian Church, embracing clergy and laity, have been called General Assemblies. See Assembly, Synod.

The position of the united church of England and Ireland, as respects its C., is exceedingly anomalous, but is incidental to certain circumstances in the constitution and polity of the country. As essentially interwoven with the state, the church possesses no independent action; its articles, liturgy, organisation as to benefices, &c., are all regulated by parliament; while its discipline falls within the scope of the ecclesiastical courts, a class of tribunals apart from the ministering clergy. The church, therefore, in its distinct capacity, is left little to do in the way of jurisdiction. It is further urged, as a reason for restricting the power of Convocation, that being purely sacerdotal, it might be apt to run into excesses, and put forth claims adverse to the prevailing tone of sentiment on religious matters; that, in short, as things stand, it is safer for the public to be under the authority of parliament than to be subject to the ordinances of a body of ecclesiastics. At the same time, it is generally allowed that some kind of reform is desirable, though how this should be effected in a manner satisfactory to all parties, it would be difficult to say. The latest Convocation, up to the time we now write, was that of the province of Canterbury, which met in London in March 1861. See Trevor's *Convocations of the Two Provinces*, Cardwell's *Synodalia*, and *Documentary Annals*.



Convolvulus :

*a*, part of stem with leaves and flower; *b*, a flower-stalk and flower, the corolla and stamens removed.

**CONVO'LVULUS** (Lat. *convolvo*, to twine together), a genus of plants, the type of the exogenous natural order Convolvulaceæ. This order contains nearly 700 known species, herbaceous and shrubby; generally with a twining stem and milky juice; large and beautiful flowers; a 5-partite calyx; a monopetalous corolla, with regular 5-lobed and plaited limb; five stamens; the ovary free, with 1—4 cells and few ovules; the fruit a capsule, sometimes succulent. The plants of this order are very abundant in the tropics, but comparatively rare in cold climates. Many are cultivated as ornamental plants, particularly species of *Convolvulus* and *Ipomœa.* The acrid milky juice is often strongly purgative; and jalap and scammony are products of this order. Some species, however, have large farinaceous roots, capable of being used as food, of which the Batatas (q. v.), or Sweet Potato, is the most important. A few are natives of Britain, and are known by the name of Bindweed. *C. arvensis* is a troublesome weed in some sandy soils in England, and *Calystegia sepium* in richer soils. The former has rose-coloured fragrant flowers, the latter large white flowers. Both are ornamental; the latter is now often planted to cover posts and trellises. *C. scammonia* yields scammony, and the root of *C. panduratus* is used as a purgative in the United States. *C. scoparius*, a shrubby species, native of the Canary Isles, yields one of the kinds of wood called Rosewood, which has a strong smell of roses.

**CO'NVOY** (Fr. *convoi*) is the name given to one or more ships of war appointed to protect a fleet of merchant-vessels against the attacks of an enemy or of pirates. If a merchant-ship part company with the C., or neglect to obey the signals, all claims of insurance are forfeited. The name is sometimes applied to the merchant-vessels so escorted. In the military service, a C. is, properly speaking, a train of wagons laden with provisions or warlike stores; the term, however, is applied also to the detachment of troops, or escort, appointed to protect such a train.

**CONVU'LSIONARIES**, the name given to a fanatical sect of Jansenists who sprang up in France about 1730. Their meeting-place was the churchyard of St Medardus, in a suburb of Paris, where was the tomb of a certain Francis of Paris, who died in 1727, and was reckoned very holy by the Jansenists on account of his extravagant asceticism. At this tomb a multitude of people poured forth fanatical prayers, preachments, and prophesyings. Miracles are also alleged to have been performed, for proof of which we are referred to a work written by M. Montgeron, a French senator, and entitled *La Verité des Miracles opêrés par l'intercession de François de Paris* (Paris, 1737). After 1731, the fanaticism of the C. increased to utter madness. 'They threw themselves into the most violent contortions of body, rolled about on the ground, imitated birds, beasts, and fishes, and at last, when they had completely spent themselves, went off in a swoon.' In 1733, the king issued an order for the imprisonment of these fanatics, but it was found impossible to put a complete stop to the mischief. They took to predicting the downfall of the throne and the church, which prophecy the French Revolution appeared to fulfil. They were not much heard of in Paris after the middle of last century, but have occurred in country-places at various times within the present century. They brought Jansenism into so much disrepute, that Voltaire declared the tomb of Francis to be the grave of Jansenism.

**CONVU'LSIONS**, a form of disease very frequently affecting infancy, in which the body is thrown into violent spasmodic contractions, the sensibility and voluntary motion being for a time suspended. A fit of C. may last from a few minutes to some hours, and may readily prove fatal, if not relieved within a short period. The first symptom observed is often a twitching of particular muscles or groups of muscles, and a change in the habitual expression or colour of the face, with distension of the features, and turning of the globes of the eyes suddenly upwards. The fingers are sometimes clenched in the palm, and the feet turned inwards; sometimes, however, C. occur absolutely without warnings of this kind, and even in the midst of perfect apparent health. Their cause is usually to be found in some source of irritation, capable of producing fever if long continued; as, for instance, disordered dentition, worms in the intestine, hooping-cough, &c. Most epidemic fevers are also apt to be attended, in children, by C. in their early stages; and diseases of the brain and its membranes at every stage of their progress. C. are greatly promoted by bad ventilation and injudicious feeding, with deficient exercise; and a great part of the cure consists in discovering and removing the causes of the disease.

When a child is suddenly seized with C., or with a tendency to spasm, such as twitching of the features, or contractions of the fingers and toes, it should be placed at once in a very free current of air, with its feet towards the fire; the extremities should be kept warm, and a cold lotion may be applied to the head, especially if there is much flushing of the face; a little castor oil may be given if the bowels are confined; and if there is flatulence, the belly may be rubbed with a warm hand, or with some simple stimulating liniment, such as camphorated oil. Not much more can be done without medical assistance; but in the event of the case being very serious, and medical aid at a great distance, it might perhaps be right to cause the child to inhale a little chloroform, great care being taken that plenty of air is also admitted to the lungs. The strictly medical treatment commonly consists in the administration of medicines adapted to the state of the bowels, with the application of cold to the head, and sometimes the inhalation of chloroform. Leeches and bleeding are very rarely useful, though too often employed.

C. are rare amongst horses and cattle. In young dogs, however, they frequently occur from intestinal worms, disordered digestion, or in connection with distemper or other debilitating diseases: they usually disappear when their special causes are removed.

**CO'NWAY, or ABERCO'NWAY**, a seaport town of Caernarvonshire, North Wales, on the estuary of the Conway, here crossed by a fine tubular, and a suspension bridge, 22 miles north-east of Caernarvon. The town, which is triangular in form, is beautifully situated on a steep slope on the left bank of the Conway, and is surrounded by walls 12 feet thick, with towers and battlements. The principal streets are well proportioned and regular, and contain several ancient houses. C. Castle, one of the noblest castellated structures in Britain, stands on a precipice overlooking the river. It was first built by Hugh Lupus, Earl of Chester, and rebuilt in 1283 by Edward I., to check the Welsh. Its walls are 12 to 15 feet thick, with eight vast towers, four of which are each surmounted by a slender turret. In 1646, the parliamentary forces took the castle, but did not injure it; but after the Restoration it was dismantled by the Earl of Conway. The Plâs Mawr, 'Great Mansion,' is a noble pile erected in 1585, in the Elizabethan style, with the exterior and interior profusely ornamented with figures, coats of arms, scrolls, &c. The harbour is dry at low water. Conway was an opulent town until the great plague in 1607 almost depopulated it. A Cistercian abbey was founded here by Llywelyn ab Jorwerth, prince of North Wales. Llywelyn the Great, and several other princes and illustrious persons, were buried in it. The Castle Hotel at present occupies its site. Pop. 2300. C. unites with Caernarvon, Bangor, Criccieth, Nevin, and Pwllheli in returning one member to parliament.

**CONWAY**, a river in North Wales, 30 miles long—one of the most noted in Wales for the bold romantic scenery along its higher, as well as the rich beautiful scenery along its lower course. It rises in a small mountain-lake where the three counties, Merioneth, Denbigh, and Caernarvon meet, and runs north-west, north-east, and north, past Llanrwst, Trefrhiw, and Conway, to Beaumaris Bay in the Irish Sea. It receives many rapid mountain-streams. In the lower 12 miles of its course it is a large, winding, smooth stream, up which the tide flows, and is navigable for vessels of 100 tons. At Conway it is half a mile broad at spring-tides, which rise here 21 to 24 feet. The C. has been famous for its pearls since Roman times.

**CONY**, an old English name for the rabbit, but employed in the authorised and other versions of the Bible as the translation of a Hebrew word which certainly does not designate the rabbit. The C. of the Old Testament is with the greatest probability supposed to be the Daman (q. v.) or ashkoko.

Daman or Ashkoko. The Cony of the Bible.

**CONY'ZA**, a genus of plants of the natural order *Compositæ*, sub-order *Corymbiferæ*, of which one species, *C. squarrosa* (also known as *Inula conyza*), is of frequent occurrence in England and throughout great part of Europe. It has a stem two or three feet high, downy ovato-lanceolate leaves, and yellow flowers. It receives the English names Fleabane and Ploughman's Spikenard, and has a strong peculiar smell, which is said to drive away fleas and gnats. In most of the languages of Europe, it bears names referring to this property.

**COOK**, CAPTAIN JAMES, one of the most eminent among England's celebrated navigators, was born October 27, 1728, at Marton, in Yorkshire, where his father was an agricultural labourer. At first apprenticed to a haberdasher, he afterwards went to sea, and having spent some years in coasting-vessels, entered the royal navy, in which he soon rose to the rank of master. The charts and observations which he drew up as marine-surveyor of the coasts of Newfoundland and Labrador, introduced him to the notice of the Royal Society, who offered him the command of an expedition to the Pacific Ocean, to make an observation of the transit of Venus over the face of the sun. The voyage being one to his taste, C. immediately accepted the offer, and set sail from Plymouth on the 26th of August 1768 in the *Endeavour*, a small ship of 370 tons. The expedition arrived at Tahiti (or Otaheite, as he named it) on the 13th April of the following year; and the transit was witnessed in a most satisfactory manner on the 3d June. Leaving Tahiti on the 13th July, C. visited New Zealand, which had not been touched at by Europeans for a century and a quarter; and after exploring the coast for six months, sailed westward, reaching (on the 19th April 1770) New Holland, now Australia, which he called New South Wales, and took possession of in the name of Great Britain. Having explored a large portion of the coast, he steered for New Guinea, passing between Australia and that island, and thus proving, what had heretofore been doubted, that the two were distinct islands. Continuing his voyage by Java, Batavia, and the Cape of Good Hope, C. anchored in the Downs on 12th June 1771. This voyage, besides vastly increasing geographical knowledge—one of the important results in this respect being, that it proved that neither Australia nor New Zealand belonged to the southern continent at this time supposed to exist, and that to the northward of lat. 40° S. no continent could exist—also added not a little to the sciences of botany and astronomy. A second voyage, for the discovery of what was then called the *Terra Australis Incognita*, which was now believed to lie in higher latitudes than had hitherto been explored, was undertaken by C. in the year of his return; and the expedition, consisting of two ships—the *Resolution* and the *Adventure*—sailed from Plymouth on the 13th July 1772. It would be out of the scope of this article to follow Captain C. through his three years' navigation of the Pacific and Southern Oceans, in the course of which time he sailed upwards of 20,000 leagues. It can only be stated generally, that his voyage proved the non-existence of land of any extent between the 50th and 70th parallels. C. arrived in England again on the 30th July 1775. So admirable had been his arrangements for the health of his crew, that during the whole voyage he lost only one man by sickness; and so skilful his seamanship, that not a spar of any consequence was lost. C. wrote an account of his second voyage himself. The belief in a practicable North-west Passage, notwithstanding the failure of attempts extending over two centuries, still held possession of men's minds; and C. had no sooner returned from his second voyage, than he offered his services to the Admiralty, who had resolved on another effort for the discovery. They were gladly accepted, and C. determined to seek the passage by the way of Behring's Strait, instead of by Baffin's Bay and Davis' Strait, the routes formerly attempted. In his old ship the *Resolution*, accompanied by Captain Clerke in the *Discovery*, C. sailed from Plymouth on the 12th July 1776. In this last voyage, C. met his death at the hands of savages, on the island of Hawaii, while endeavouring to recover a boat which had been stolen from the *Discovery*. This tragical event occurred on the 14th February 1779; not, however, before C. had made valuable additions to our geographical knowledge of the coasts of America and Asia, in the region of Behring's Strait. The news of his death occasioned deep and general regret in England. The king granted his widow a pension of £200, and each of his children £25; while the Royal Society did honour to his name, by having a gold medal struck in his commemoration. C. was one of England's greatest navigators. A practical and scientific seaman, he was also a sagacious, self-possessed commander, kind although strict to his crew, and marked by indomitable perseverance and ready decision.

**COO'KERY.** To prepare and soften food by the action of fire, and so to render it fit for digestion by the human stomach, has been a general custom from remote times; and more or less of skill in accomplishing this primary end has been displayed, according to the knowledge, wealth, and refinement possessed by each nation or people.

In ancient times, the occasion of a banquet appears chiefly to have arisen in a sacrifice to the gods, when a part of the victim was brought to the dwelling of the sacrificer, and was cooked for the feast. Birthdays, funerals, and victories were also celebrated in this manner. 'The Persians,' says Herodotus, 'were accustomed to honour, above all others, that day on which they were born, when the rich among them would sacrifice an ox, a horse, or a camel, which they roasted whole in ovens, while the poorer class gave only the smaller animals, as sheep. Yet the Persians were not great eaters of meat, but consumed much sweet food, and did not use salt.' The appendages to the higher order of banquets were most magnificent, so that in point of quantity and display they were very expensive. Herodotus says on this head, 'that the Greeks who invited Xerxes to supper all came to the extremity of ruin; and that, wherever he took two meals, dining as well as supping, that city was utterly ruined.'

The Egyptians, it is said, were great bread-eaters. Though they possessed wheaten-flour of the finest sorts, they do not appear to have used it for their common bread, which was made of spelt, or of the centre of the lotus dried and pounded. Fish they salted and dried in the sun; quails, ducks, and small birds they salted and ate raw. We read of their roasting and boiling the flesh of the ox. Large flocks of geese and of fowls were kept by them for the use of the table, hence their plan for the artificial hatching of eggs. 'Fish was used by all classes except the priests, but the staple food of the people consisted of vegetables, of which they had a large supply.' Herodotus mentions their making beer from barley, which they called *lythus.* We may still see the form in which their food came to table; ducks, loaves made round, and some biscuits and cakes, which have been taken from Egyptian tombs, are to be found in the British Museum. Apollonius, who wrote a treatise on the feasts of the Egyptians, says that they ate in a sitting posture, using the very simplest and most wholesome food.

There appears to have been considerable difference as to the manner in which good eating was appreciated in different parts of Greece. The Athenian meals are ridiculed by the comedians for their parsimony. After the Homeric age of simplicity, in which roast and boiled meat seems to have sufficed the kingly table, a diversity of preparation was obtained in cooking, and a certain epicureanism displayed in the quality, seasoning, and method of dressing food. The names of many authors of C. books are preserved in the writings of Athenæus; that of Archestratus, who is called the guide of Epicurus in his pleasures, and styled the inventor of made dishes, being the most renowned.

Fish was a principal article of food with all classes of Greeks; but with the wealthier, much skill and delicacy were used in cooking it, and choice and expensive sorts were sought after. Archestratus writes of 'a boiled torpedo done in oil and wine, and fragrant herbs, and some thin grated cheese.' Fish, stuffed with forcemeat and fried, boiled in pickle, baked in fig-leaves soaked in oil, cooked in hot ashes, &c., are among the recipes we find recorded. Large quantities of salt-fish were brought from the shores of the Euxine and the Hellespont; and this, with meal, cheese, and onions, was the chief food of the armies and navies when on service. The Greeks boiled and roasted the flesh of sheep, pigs, lambs, and goats. They had poultry, small birds, and game, and sausages made of blood, partaking of the character of black-puddings. The bread made at Athens was the most celebrated; it was sometimes household, but chiefly bought in the market, and was made in great variety, as pan-loaves, rolls, sweet loaves, &c. The bread eaten by the poorer classes was made of barley, and sometimes flavoured with oil, honey, poppy-seed, &c. Athenian cheese-cakes were also famous; and they had honey and sesame-cakes, which, with fresh and dried fruits, as figs, almonds, olives, and nuts, seem to have been partaken of after dinner. They consumed vegetable food also in abundance, and had cabbage, onions, lettuce, and so on.

In the Greek house there was no regular cook, though in the establishments of the wealthy several females were kept, to attend to the kitchen. The women, in general, saw to the requirements of the table, and even the lady of the house was not idle. Cooks stood in the market at Athens, ready to be hired for particular occasions; the most celebrated were those of Sicily; they were probably persons of some importance.

'To roast some beef, to carve a joint with neatness,  
To boil up sauces, and to blow the fire,  
Is anybody's task; he who does this  
Is but a seasoner and broth-maker;  
A cook is quite another thing. His mind  
Must comprehend all facts and circumstances:  
Where is the place, and what the time of supper;  
Who are the guests, and who the entertainer;  
What fish he ought to buy, and where to buy it.'  
*Quoted by Athenæus from Dionysius, a comic poet.*

In the early days of Rome, a gruel made of barley, and called *puls*, was the principal food of the people, and with green and other vegetables was, till later times, the usual fare of the inferior classes—meat being used but sparingly. By degrees, however, a taste for better eating crept in; and after the Asiatic conquests luxury was imported. Lucullus introduced habits of epicureanism after his return from Asia; the gourmand Apicius earned for himself a deathless name. The wealthy Romans cared for the elegant serving of their table, as well as for the quality of viands placed before them. With them, as with the Greeks, fish was a necessary as well as a luxury: they took much trouble to procure their oysters, and gave large sums for other fish. We read of a mullet of six pounds sold for 8000 sesterces (£70, 16*s.* 8*d.*), and of the rhombus or turbot from Ravenna being held in high estimation. They seem to have been as clever as the French in preparing *surprizes*, and in carrying out *disguises* in their dishes. The *pistor*, who made the bread and pastry, and the *structor*, who composed artificial figures of fruit or flesh, and who also arranged the dishes, seem to have shared the duties of the cook. We read of dainties, as ring-doves and fieldfares, hares, capons, ducks, peacocks, pheasants, and the livers of geese; also of such a formidable *pièce de résistance* as a 'huge boar, surrounded with sucking-pigs made in sweet paste, which were distributed among the guests.' The Romans prepared and cooked their food with oil to a great extent. Their meals probably consisted of two courses and a dessert, the first course being of materials intended to sharpen the appetite, and the second the 'brunt of war,' that is, a joint roasted or baked. The discovery or cultivation of vegetables, perhaps, gave rise to some proper names, as Lentulus, Fabius, &c. It is a Roman saying, that the number of persons at a repast should not be less than that of the Graces, nor more than that of the Muses. The Greeks and Romans used honey for the purposes for which we use sugar. The sugar-cane probably was cultivated in China, and its manufacture understood there; but the Greeks took it for a kind of concrete honey, and used it only for medicinal purposes.

Of ancient British C., nothing is known; it was probably of an extremely rude description. Hares, poultry, and fish are said to have been forbidden as food. We do not find much mention of the art of C. in the Saxon chronicles. The Danes and Germans appear to have been great drinkers, and to have paid little attention to the preparation of their eatables. The Normans were more curious in these matters; some offices among them were held in right of the kitchen. In early English C. much use was made of the mortar. Oil and lard were used instead of butter. Several English C. books bear an early date, as *The Forme of Cury*, by Mr Pegge, 1390; and others date as follows: Sir J. Elliott's book, 1539; Abraham Veale's, 1575; *The Widdove's Treasure*, 1625.

The C. of France was probably of an imperfect and rude kind, till the introduction of Italian tastes by the princesses of the House of Medici. The ancient use of oil was modified by the discovery made by the French, of dressing meat in its own gravy. In our own day, there is no denying that the French cook is a true artist. We may, if we please, impute the trouble he takes with the dressing of his meat to the inferiority of the material, but this can be said of meat only; the preparation of vegetables and fruits is attended to with equal care, although, probably, the French have some of these things in greater perfection than ourselves. The great difference between French and English C. consists in the fact, that they cook their meat much longer than we do. They consider that this renders it more digestible. They are thereby enabled to multiply dishes by altering or annihilating the original taste of the meat, and making it a vehicle for foreign flavours. The variety, daintiness, and grace of form which dishes thus acquire, is advantageously made use of by us, when we admit them at our repasts to mingle with our heavier and radically English joints. But, for ourselves, we desiderate the integrity of the form and flavour of our meats, considering that to be *over-cooking* which the French think only sufficient. In the point of economy, the French have a decided superiority over us. The French cook throws nothing away. Instead of going to the butcher for meat for stock, as our English cook does, he uses the trimmings for stock and glaze, and the skimmings of his boiled meats for purposes to which we apply butter or lard; and like a true workman, he produces great results from small means. This requires an education which few mistresses demand and few cooks obtain, but which, when achieved, justifies the expression of Voltaire:

> Qu'un cuisinier est un mortel divin!

The estimation in which the services of a cook are held, may be known by the large salary attached to the office in great families, hotels, and club-houses. A visit to the kitchens of one of these establishments will teach us what a highly important post is that of *chef de cuisine*. There must be in such a person not only the necessary knowledge how things are to be done, but the power to arrange and direct the work of the numerous assistants, as to the exact part they must fulfil at each moment of their long and busy day. These places, indeed, are excellent schools for cooks, where they can undergo that severe training, without which a thorough practical knowledge of the business cannot be attained. It is indeed to be regretted—because a source of so much disappointment, discomfort, and waste—that a knowledge of plain C., at least, is not more desired by mistresses for themselves. That acquirement, and household management generally, are important enough to be made part of the education of all classes. The poorer would thereby be enabled both to lay out their money profitably, and to prepare their food so that it might satisfy and nourish them; and the heads of establishments in the upper classes would be more in a position to direct, appreciate, or, if necessary, condemn the performance of the cook. A cultivated and elegant taste is as much shewn in the arrangement of viands as in the furnishing and decoration of the choicest boudoir.

The art of C., as a branch of female education, has lately engaged considerable attention in England; and there are now in London, Edinburgh, and other places, establishments where young ladies receive this kind of instruction; more particularly in the art of making pastry and confectionary. Efforts are also made to teach C. to the humbler classes of girls, but much in this respect remains to be done. For any shortcomings in cooking, however, the taste of the English is in some measure accountable. The universal practice of roasting large pieces of meat, which cannot be consumed while hot, causes no little waste, and is obstructive of improvement. The Scotch—who derive some part of their C., along with other usages, from the French—deal more in soup and boiled meat than the English, and their processes, while not less savoury, are perhaps more economical.

So numerous are the books on C., that it would be out of our power to name even all the excellent ones. We can only say that Miss Acton's *Cookery Book*, Webster and Parkes' *Encyclopædia of Domestic Economy*, Soyer's work, and that of Francatelli, cook at the Reform Club, are all good; *Meg Dodds's Cookery* is also excellent. For cheapness and simplicity, we may refer to Chambers's *Cookery for Young Housewives* (1s.). The two last mentioned embrace Scotch along with English cookery. See FOOD, BOILING, ROASTING, &c.

**COOKERY**, ARMY, is now becoming an important feature in the English military system. The sufferings in the Crimea in the winter of 1854—5 drew public attention to the subject; it was then found that C. was little understood by the British troops, and that the soldiers seldom had meat otherwise than boiled. M. Soyer was sent out by the government, principally to advise in reference to hospital C., but also to improve the system of camp-C., so far as military routine would allow. He devised new forms of stove, and constructed recipes for using to the best advantage all the available provisions for a camp. The officers at Sebastopol made a highly favourable report of Soyer's *field-kitchen*, a kind of camp-stove, with a caldron holding 12½ gallons: two such stoves would easily cook for a company of 100 men; both could be carried by one mule, with sufficient dry wood for three days' fuel. Though mainly intended for boiling, the apparatus afforded facilities for many varieties of cooking. When M. Soyer returned to England, he made a few improvements; and finally the apparatus presented itself as a sort of upright can, suitable for boiling, steaming, baking, roasting, stewing, and making tea or coffee: with 14 lbs. of fuel, one of these would cook for 50 men; and if twenty such were placed near together, four cooks could serve for 1000 men.

A committee which inquired on the subject of barrack economy a few years ago, recommended that every large barrack should have a bakery with two ovens, where the men could learn to make and bake their own bread; and that the barrack-kitchens should be so furnished as to enable the men to bake their meat if so inclined, instead of being confined, as heretofore, almost wholly to boiled dinners. The recommendations of the committee are gradually being acted on, by the use of new and carefully arranged stoves. In the splendid new barracks at Aldershott (q. v.), the cooking arrangements are superior to any hitherto adopted in the British army.

At various times in 1859 and 1860, certain highly ingenious forms of apparatus were tried, to test the possibility of cooking for troops while *the kitchen itself is on the march*. One of these inventions consists of a compact set of stoves and caldrons, fitted into a wagon, and has been found on trial to answer the purpose perfectly.

**COOK ISLANDS**, otherwise known as the Harvey Archipelago, were visited rather than discovered by the navigator whose name they bear, during his first voyage. They lie about midway between the Society and Navigator groups, near lat. 22° S. and long. 158° W. The principal members of the cluster are Mangeia, Atiou, Harvey, and Raratonga. The natives, loosely estimated at

50,000, have been generally converted to Christianity; Raratonga, in particular, being one of the most successful missions in Polynesia.

**COOK'S INLET**, one of the many gulfs of the Pacific Ocean on the north-west coast of America, lies between Prince William's Sound on the east and Bristol Bay on the west, in lat. 58°—61° N., long. 151°—154° W. It was explored in 1778 by the navigator whose name it bears, in the vain hope of its leading him into the Arctic Sea.

**COOK'S STRAIT**, discovered by Captain Cook on his first voyage, separates the north and middle islands of the New Zealand group. The proof of its existence dissipated the popular belief that New Zealand, as previously known, was merely a salient point of a great southern continent.

**COO'KSTOWN**, a town in the north-east of the county of Tyrone, Ireland, on the left bank of the Ballinderry, 23 miles east-north-east of Omagh. It consists of one very long and broad street, with a row of trees on each side. It has a linen trade. Pop. 3289.

**COOLERS**, or **CONTRI'VANCES FOR COOLING**, are resorted to by the brewer, and by the distiller of alcohol and other liquids. See BEER and DISTILLATION. They are also used in warm weather for the cooling of water (q. v.).

**COO'LIES**, or **COULIES**, originally the name of one of the aboriginal or hill tribes of Hindustan. From the circumstance that many of this tribe are employed as labourers and porters in Bombay and other places, the name is applied by Europeans in Hindustan to porters in general; and it is now used to denote emigrant labourers from India and China to tropical and other countries. The importation of this useful class of labourers to the Mauritius, West Indies, and British settlements on the mainland of South America, has grown up as a result of negro emancipation. In all those countries just alluded to, where wild land could be taken possession of by squatters, and from which a livelihood could be easily obtained, there has been, as is generally acknowledged, an indisposition on the part of emancipated slaves to become regular hired labourers. Hence, as is alleged, the necessity for resorting to imported labour from India or China. Barbadoes presents, perhaps, the most remarkable example of an absence of such necessity, because being universally appropriated and cultivated, it really leaves no space for squatting, and the alternative is practically labour or starvation. The necessity for importing C. seems, in short, to depend on the amount of land that may be unauthorisedly taken possession of; and nowhere, according to all accounts, is this more conspicuous than in the now ill-conditioned island of Jamaica.

Much difference of opinion prevails as to the propriety of coolie immigration. It is one of those vexed questions on which something can be said on both sides. It may be admitted that there have been instances of cruel deception in luring C. from the place of their nativity; and also at times most cruel usage, like that endured by slaves, in the passage across the ocean to the place of destination; but looking to some of the official details on the subject, as well as to the vast importance of providing free labourers for the West Indies, it is evident that coolie immigration, conducted under proper regulations, may be a means of greatly improving the condition and prospects of the redundant population of India, as well as of benefiting the countries where continuous and cheap labour is now grievously deficient. We would refer to the work of Mr A. Trollope, *West Indies and Spanish Main* (1860), for some general observations on the introduction of C. to certain British West India settlements. Here it is to be noted, that the immigration of C. is now placed under so strict a system of magisterial control as scarcely to admit of abuse. As a general rule, the plan followed is to cause all the hirings for a term of years to be transacted before a proper tribunal at the port at which the C. arrive. The terms entered on must be faithfully fulfilled by the employer; and the labourer, at the end of his service, must, if he wish it, be sent home free of expense. In point of fact, large numbers return with considerable sums, the fruit of their industry.

A return to the House of Lords, 14th July 1859, gives the following particulars concerning the immigration of C.: 'The sum expended for immigration on account of the colony of British Guiana, from January 1841 to the 30th June 1858, was £846,155. Of this sum, £691,777 was expended out of the colonial funds, and £154,377 by the planters. No payment has been made by the British government on account of this immigration. The planters commenced to pay some proportion in 1851, and continued to pay every year. The total amount of £846,155 was spent as follows: £9070 for the importation of immigrants from the West Indies, £46,550 for the importation of Africans, £95,413 for the importation of Portuguese and Cape de Verde Islanders, £507,310 for the importation of coolies, £14,198 for the importation of Chinese, £103,650 interest on loans, and £19,650 general expenses. The number of coolies imported from Calcutta was 18,532, and from Madras, 8248; total, 26,779. The average number of deaths amongst every 100 immigrants from India, during the period between 1st January 1838 and 30th June 1858, was 5·2. 3579 Indian immigrants were returned to India from 1843 to 1858. The mortality in the colony was 5291. The deaths amongst every 100 immigrants were 3·72 in 1855, 3·11 in 1856, 4·88 in 1857, and 1·31 in the half-year ended 30th June 1858. Of Chinese immigrants there were brought 647. The number of deaths was 269. The number of deaths amongst every 100 immigrants was 13·39 in 1854, 8·04 in 1855, 5·04 in 1856, 4·79 in 1857, and 0·71 in the half-year ended 30th June 1858. In Jamaica there were brought, from 1845 to 1854, 4551 coolies from India, and 472 from China. The amount paid on account of such immigration was £83,702. From Calcutta to Trinidad there were embarked 11,631 immigrants from 1843 to 1858; of this number there died on the passage 749, landed 10,882, and sent to hospital 111. From Madras to Trinidad there were embarked 2095 immigrants; of these there died on the passage 22, and landed 2073. From China to Trinidad there were embarked 1012; died on the passage 24, landed 988, and sent to hospital 22. From Trinidad to India there were embarked 1890, and the amount of savings deposited by them was £29,954. For the colony of Grenada there were embarked at Calcutta 777 coolies; of these 132 died on the passage, and 645 landed. Since their arrival 53 died, and there remained as agricultural labourers 592. The amount paid by the colonial fund was £7666, and the amount paid by the planters £3601. Coolie immigration did not commence in the island before May 1857. The number of immigrants that landed in the Mauritius was about 250,000 since 1834; of these there died 35,000, and 55,000 returned to India, and there remained in the colony 160,000. From 1840 to 1844, 8000 or 9000 Chinese immigrants were received from Calcutta, Singapore, and other places in the Straits, but none direct from China; they were unaccompanied by females, and were introduced entirely at the expense of private parties.

From 1844 to 1853 this immigration had ceased; in the latter year, the Spanish ship *Sancta Lucia* arrived here from Macao, with 222 men and boys, bound to Cuba; the ship having to undergo extensive repairs, the captain disposed of the men here to the dock company who repair the ship. No other Chinese labourers have been received since. Hardly any of these men have remained in servitude—they have become traders, artisans, and cultivators; many have left the colony or have died; but being mixed with many others of their race who arrived as traders, it is now impossible to furnish a return of that population that could be at all relied upon.'—*Annals of British Legislation*, by Leone Levi, vol. viii.

**COOMA'SSIE**, the capital of the kingdom of Ashantee, Western Africa, is situated about 120 miles N.N.W. of Cape Coast Castle, in lat. 6° 35′ N., long. 2° 12′ W. C. occupies the side of a rocky hill, and is about four miles in circuit. The walls of the houses are mostly formed of stakes and wattle-work, the interstices being filled up with clay; the roofs are of palm-leaves. The king's palace is here. The population is stated by the natives at 100,000; but this estimate would appear to be very much exaggerated, and other authorities set it down at not more than 20,000.

**COO'PER**, James Fenimore, an American novelist, was born at Burlington, New Jersey, United States, September 15, 1789. Having received his early education from a private tutor, he, at the age of 13, passed to Yale College, and after three years' study there, entered the American navy as a midshipman. He remained six years at sea, gathering the experience of which he was afterwards to make such good use in his novels. On his retirement from the sea in 1811, he married; and the next ten years of his life were spent in a quiet, domestic fashion. In 1821 appeared his first work, *Precaution*, a novel that afforded no indication whatever of the talent he subsequently exhibited. In the following year, however, he published *The Spy*, a tale which at once secured for him a place in the first rank of novelists. By not a few critics he was even elevated to a higher pedestal than that which Scott occupied; but time sobered their judgment, while it still left him a deservedly high position as a writer of fiction. In quick succession followed *The Pioneers*, *The Pilot*, *The Last of the Mohicans*, *The Red Rover*, and *The Prairie*, with which C.'s genius culminated; for though between this date (1827) and 1850 he wrote about 26 different works, none of them equalled in merit those we have mentioned. The secret of C.'s success as a novelist lies in his graphic descriptive powers, and his thorough knowledge of the matters he describes—whether it be the boundless ocean or the broad prairie—together with an attentive study of character. Not a little of his popularity in America, however, must be attributed to his nationality; and in Europe a good deal of it was owing to the freshness of the scenes in which his stories were laid. About 1827, C. visited Europe, where he remained several years; the fruits of his sojourn, besides novels, being some ten volumes of sketches of European society, which added nothing to his reputation. Many of his works have been translated into most modern languages, and one—*The Spy*—can be read in Persian. C. died at Cooperstown, in the state of New York, 14th September 1851.

**COOPER**, Sir Astley, a celebrated English surgeon, was born at Brooke, in Norfolk, where his father was a curate, in August 1768. In his 16th year, he went to London, and placed himself under the care of Mr Cline, one of the most noted surgeons of his day. He devoted himself with ardour to his profession, and was a constant attender at the dissecting-rooms, and also at the lectures of the famous John Hunter. In 1787, C. was appointed demonstrator of anatomy at St Thomas's Hospital; and four years after, he assisted Mr Cline, who was surgeon at St Thomas's, in the course of lectures on anatomy and surgery. In 1792, he was appointed Professor of Anatomy at Surgeons' Hall; and in 1800, surgeon to Guy's Hospital. In 1813, he received the professorship of comparative anatomy in the College of Surgeons. Meanwhile, C. had been enriching medical literature by various contributions. An essay on the effects resulting from the destruction of the *membrana tympani* gained him, in 1802, the Copley medal of the Royal Society, of which he was elected a fellow three years afterwards. In 1804—1807 appeared his great work on *Hernia*, with illustrations mostly of life-size, a contribution of the utmost value to medical science—the anatomy of the disease and the mode of operating for its relief being alike ill understood before—though in a pecuniary point of view it proved very unprofitable to himself. The practical part of his profession was not neglected during this time. He was the first to attempt the tying of the carotid artery, an attempt which, though unsuccessful in his hands, has since proved effectual in the hands of other practitioners. His annual income, which in the fifth year of his practice only amounted to £100, had in 1813 risen to the enormous sum of £21,000, perhaps the largest ever received by a surgeon. In 1817, he tried what has been considered the boldest experiment ever attempted in surgery, the tying of the aorta, which did not prove successful; and it has since been tried with no better result. In 1820, C. removed a steatomatous tumour from the head of George IV., who marked his appreciation of the operation by conferring a baronetcy upon C. some six months after. In 1822, he was elected one of the Court of Examiners of the College of Surgeons, and in 1827, President. In the following year he received the appointment of sergeant-surgeon to the king, and in 1830 was made Vice-president of the Royal Society. Other honours flowed in upon him. He was made a member of the French Institute, and corresponding member of the Royal Academy of Sciences, a D.C.L. of Oxford, and an LL.D. of Edinburgh. Ever busy with his pen as with his knife, he, in 1822, published a work on *Dislocations and Fractures*, which threw much new light on the subjects discussed, and also suggested improved methods of treatment. His treatise on the *Anatomy and Diseases of the Breast* (1829—1840) was characterised by all the care, research, and originality which distinguished his previous works; so likewise was his *Anatomy of the Thymus Gland*, 1832. C. died 12th February 1841. A colossal statue to his memory is erected in St Paul's Cathedral, London. As a teacher, C. possessed the faculty of communicating knowledge in a manner at once easy and agreeable; and he elevated medical surgery, the operations of which before his time have been described as a series of 'frightful alternatives, or hazardous compromises,' into a science.

**COO'PERAGE**, the art of making vessels of pieces of wood bound together by hoops. It is a very ancient art, such vessels having been in use among the Romans at the period of the Christian era. The upright pieces forming the sides of a barrel or cask, or other cooper's work, are called *staves*; and as casks are usually larger in the middle than at the top and bottom, this swelling, called the *belly* or *boulge*, is formed by skilfully shaping each stave so that it shall form part of the required double conoid, and that, when all are built and hooped together, their edges shall coincide perfectly; for this purpose each stave is made broadest in the middle, and narrowed down in a curved line towards each end. A skilful cooper can work this curve so accurately, that no further fitting or alteration shall be needed when the staves are put together. The staves are made to meet at their inner edges, and by driving the hoops very hard, the inner part is compressed until the slight gaping outside is closed, and thus slight inaccuracies of fitting are remedied.

There are several branches of cooperage. The *wet* or *tight* cooper makes vessels for holding liquids. The *dry* cooper does inferior work, such as barrels for containing dry goods, where an inferior degree of accuracy is sufficient. The *white* cooper makes churns, pails, &c., which for the most part have straight sides.

The best work is made of oak, which must be thoroughly dried before being put together. In warm countries, the drying of the sun is sufficient, and casks are therefore mounted in summer only; but in Britain, artificial drying is commonly resorted to. The hoops are hammered down from the narrow to the wide part of the cask, by means of a mallet striking a piece of wood held against the hoop. Iron hoops are sometimes put on hot, in order that their contraction on cooling may bind the work together.

**CO-OPERA'TION** is the term applied to systems of united effort for commercial or industrial purposes among artisans, and has lately been demonstrated in a most remarkable manner in several parts of England and Scotland, more particularly in Lancashire and Yorkshire. C. bears no resemblance to Communism, Socialism, or any other fanciful scheme of human society. It refers simply to a joint-stock copartnery on plain commercial principles, with limited liability of members; but by the interposition of the legislature for protecting individual interests, and encouraging self-denial and thrift, it possesses some distinct and valuable features. Usually, a co-operative society consists of a body, several hundreds in number, belonging to the manual labouring-classes, and the object is the distribution of articles of daily consumption among the members. A store is established, where all make their purchases; the goods are not sold cheaper than the market-price; but everything is of the best quality, and the sales are all for ready money. The profits of the concern, after paying expenses, are divided in a manner immediately to be described. The real meaning of C. so far, is the abolition of credit and of small shops, the buying of unadulterated articles, and a participation in the profits of trading—the whole system having a beneficially elevating tendency, and only being practicable where the working-classes possess a considerable degree of intelligence, with good business notions. Membership is constituted by payment of shares. Ordinarily, the share is one pound sterling, to be paid up at once, or by small weekly instalments. By 18 and 19 Vict. c. 63, a member can own shares to the amount of £200. The shares are not transferable; they are just so much in-put to the concern, and at the request of the holder the amount is paid back, on due notice of withdrawal being given; this constitutes the chief difference between C. and the common joint-stock system of business. The peculiarity of making the shares personal to the holder, is most valuable; for by it all stock-jobbing or gambling in shares is prevented. When a member dies, his shares are accounted for to his representatives. If more money is paid in by members than is wanted, the directors can order the overplus to be taken back. The first shilling paid in, and the last shilling at the credit of a member, on drawing out, are carried to a fund called Redemption-money, which is designed to make good the deterioration of property. Each member has a little book in which his account is kept. All purchases for the concern are in cash, and, as above stated, all sales are only for cash. There is no credit whatever, and hence little book-keeping. On selling articles, a tin ticket is given, with a sum stamped upon it corresponding to the sum paid; for example, if a person buys a shilling's worth of tea, a ticket with 'one shilling' impressed on it, is given in exchange for the money. These tickets are vouchers for purchases. They are kept by the buyer till the end of the quarter, when, being produced, it is seen what has been the aggregate amount of his purchases; to which the proportional share of profit is paid in cash, or put to the credit of the individual. Persons not members may buy at the store, and assign their tin vouchers to members, though it may be arranged that the profits represented by such vouchers shall be reckoned as payment towards a share; by which means very poor persons may acquire membership. From the whole profits, the first charge is for management; second, for dividends of certain rates per cent. on shares or capital; and third, for division on sales.

Co-operative societies are registered pursuant to 13 and 14 Vict. c. 115, by which the following benefits are secured. The rules of the society are binding, and may be legally enforced—protection is given to members, their wives, children, and heirs in enforcing their just claims, and against any fraudulent dissolution of the society; the property of the society is declared to be vested in the trustee or treasurer, who may, with respect to the property of the society, sue and be sued in his own name; fraud committed with respect to the property of the society is punished by justices. For various other benefits we refer to the statute.

By prudent management, numerous co-operative societies in England have reached an extraordinary degree of success. The most remarkable of the whole is the Rochdale Equitable Pioneers' Society, which, beginning in 1844, with a capital of £28, its affairs, at the end of 1859, stood thus: Number of members, 2703; amount of funds, £27,060; business done in 1859, £104,012; profit made in 1859, £10,739, 18*s.* 6½*d.* In 1860, the business done amounted to £152,063, and the profits were £15,906. The society continues steadily to increase. In its proceedings is offered a surprising example of what may be done by C. when properly conducted. One material cause of the prosperous extension of this undertaking consists in the fact, that members allow their dividends and profits to accumulate to their credit, instead of drawing them out as they accrue, and spending them. Out of the successes of this society sprang several other gigantic concerns, so that the principle of C. has begun to assume a new phase, far beyond store-keeping. At Rochdale, Leeds, and elsewhere, co-operative societies composed of working-men have set on foot large cotton-factories, flour-mills, or other industrial establishments, which compete in the general field of manufacturing enterprise. In these concerns, the operatives receive weekly wages, and also dividends on profits after paying for management. All have an equal voice in appointing managers, whatever be the number of shares held by them individually. Alexander Redgrave, Inspector of Factories, in his Report, 30th April 1860, says: 'Co-operative societies have multiplied greatly since the passing of the Limited Liability Act. They are composed generally of operatives. Each society has a capital of £10,000 and upwards, divided into shares of £5 and £10 each, with power to borrow in certain proportions to the capital subscribed; and the money borrowed is made up of small loans by operatives and persons of a like class.' According to a list of co-operative societies made up in September 1860, there were then 31 manufacturing companies either wholly at work or in progress, with an aggregate capital of £1,088,000. As a new development in social economics, this principle of C. has not yet received much public notice, but as significant of very extraordinary changes in the position and prospects of the operative classes, it is eminently deserving of consideration. For further information on the subject, we may refer to sundry papers in the published *Transactions of the National Association for Promoting Social Science* (Parker, London); also Chambers's *Social Science Tracts*, No. 1 (price 2*d.*), *Co-operation in its Different Branches* (1860). For some account of a system of C. for the purpose of building dwelling-houses, see BENEFIT SOCIETIES. W. C.

**CO-O'RDINATES.** What is called the method of C. is an invention of Descartes, whereby algebra and the calculus may be employed in geometrical investigations. The method is sometimes called algebraical geometry—sometimes, and more properly, analytical geometry; and it is commonly treated under the heads 'geometry of two dimensions,' and 'geometry of three dimensions,' according as it is applied to investigate the properties of figures all in one plane, or of curved surfaces. The method is capable of popular explanation. C. are lines so measured off from a fixed point, called the origin of C., along fixed lines passing through it, called the axis of C., as to determine by their quantities the position of any other point relative to the origin. The first step is to find how to determine the position of a point in a plane. Take any fixed point in it for the origin of C., and through it draw two fixed lines—the co-ordinate axes—at right angles to one another. Then, if the perpendicular distance of the point from each of these axes be given, its position will be determined. Referring to Fig. 1, if P be the point, and O be taken for the origin of C., OX, OY for the axes, then if we know NP or OM, the perpendicular distance of P from OY, and measure off from O, OM on the axis OX, and through M raise a line perpendicular to OX, P must lie in this line, for it contains all the points in the plane which are at the perpendicular distance OM from the axis OY. Similarly, if ON or PN, the perpendicular distance of P from the axis OX, be known, and we measure that distance off from O along OY, and through N draw a perpendicular to OY, the point must be in that perpendicular. It is therefore at the intersection of the perpendiculars through M and N respectively. When, as in the figure, the fixed lines are at right angles to one another, the C. OM, ON are called the rectangular C. of the point. Let us now see what use can be made of this mode of determining the position of the point, for the discovery of the properties of lines and surfaces. As the values of the C. change for the different points in the plane, they are denoted by the variables $x$ and $y$. Now, if we suppose the point P to begin to move according to a determinate law, and the C. to change their magnitudes so as always to be its C., knowing the law of P's motion, we are able to express in algebraical language the law of the corresponding changes in its co-ordinates. For instance, if P moves so as to be always at the same distance from O, OP is constant, and (47th Prop. Euclid, Book I.) the square on OP is equal to the sum of the squares on OM and PM. Putting this into algebraical language, we have the equation, $x^2 + y^2 = R^2$, or $y = \pm\sqrt{R^2 - x^2}$, where $R = OP$. This is called the equation of the circle referred to its centre as origin, and to rectangular C.; and it expresses the law according to which the changes of the C. must take place: and from this equation, combined with that to a straight line, &c., every property of the circle may be determined. If P move so that the sum of the distances from two fixed points shall be always the same, and we express the relation between $x$ and $y$ in that case, we should have the equation of an ellipse. This suffices to shew in a general way the nature of the method. Equations between $x$ and $y$ are called the equations of the lines, whether straight or curved, traced out by the point P; and by means of them, though they but express relations between *quantities*, the *qualities* of the lines to which they refer may, by artifices explained in every treatise on the subject, be detected. Nay, by assuming equations between $x$ and $y$, and examining the lines which points represented by them would trace, many singular curves have been discovered. There are a variety of conditions to be attended to in the interpretation of such equations, depending on the assumptions set out with, in choosing the origin and axis. The axis of $x$ or OX being taken to the right of the origin, and the axis of $y$ or OY being perpendicular to it and above it, $x$ and $y$ are counted positive when they are measured along their axes to the right of and above the origin respectively, and negative when they are measured to the left and downwards respectively. Suppose $x = OM = ON$, and $y = MP = MP_1 = NP_3 = NP_2$, the C. of the points P, $P_1, P_2, P_3$ would be $(+x, +y), (+x, -y), (-x, +y), (-x, -y)$ respectively. These points being equidistant from O, we may suppose a circle to pass through them. Recurring now to the equation of the circle, $y = \pm\sqrt{R^2 - x^2}$, the meaning will be seen of the two values + and − of $y$ given by the quadratic. Often the axes of C. selected for convenience are oblique, i. e., inclined at some other angle than a right angle. An equation between C. referred to one set of axes may always be transformed to C. referred to another, by the process known as the transformation of co-ordinates. A similar transformation of equations by the same process may be made where it is desired to refer the line to a new origin.

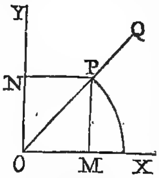


Fig. 1.

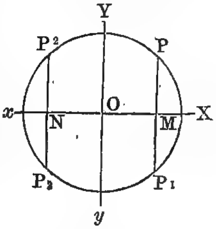


Fig. 2.

What has hitherto been said refers entirely to the C. of a point in a plane, or to what is called geometry of two dimensions. But the rationale is the same with that of connecting in equations the C. of points in space—the subjects of geometry of three dimensions. The position of a point in space requires three C. to determine it, and these are usually denoted by the symbols $x$, $y$, $z$. An origin being taken, and three axes, OX, OY, OZ, mutually at right angles to one another, the point is referred to the three planes through these axes. $z$, or PN, is its height above the plane through YOX; $y$, or NM, is its distance perpendicularly from the plane XOZ; and $x$, or OM, is its

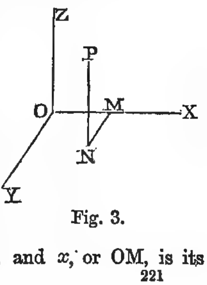


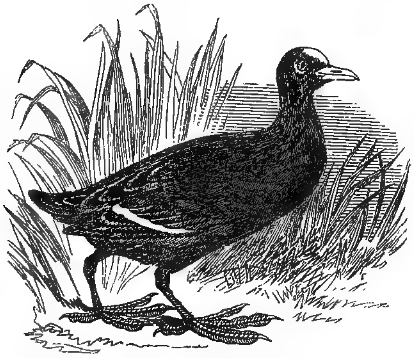
Fig. 3.

perpendicular distance from the plane ZOY. It is clear that these three determine the position of the point. In three dimensions, as in two, the problem may be stated to be: Given the law of the motion of P, to express the law regulating the variations of its C. as it moves. The algebraic expression of the latter law is, the equation of the surface traced by the point in moving over all the space it can traverse consistently with the law of its motion. The method of C., besides its use in geometry, is of great value for resolving forces in mechanics, and also for finding the resultant of a great many of them.

**COORG**, a district in the presidency of Madras, bounded by Mysore, Malabar, and Canara, is situated in lat. 11° 56′—12° 45′ N., long. 75° 25′—76° 13′ E. It contains about 1420 square miles, and more than 65,000 inhabitants. Down to 1834, it was a native principality of ampler dimensions. As at present defined, C. appears to be wholly within the basin of the Cauvery, one of the chief tributaries of the Bay of Bengal. From its elevated situation—the lowest point is more than 3000 feet above the sea—C. is exposed to both the south-west and north-east monsoons. Hence the yearly fall of rain amounts to about 120 inches. For the same reason, the temperature is comparatively low and equable. Nearly the whole of this rugged region is covered with forests, more or less dense, but seldom so full of undergrowth as to form jungle. The zoology of C. comprises elephants, tigers, bears, &c., with birds and reptiles in vast variety. The natives, mostly Nairs, are handsome and athletic. Among them there exists a community of wives between brothers. But C. has perhaps nothing so worthy of notice as its artificial fortifications. The country is intersected by ramparts, which are from 15 to 25 feet in height, and by ditches of about 10 feet in depth and about 8 in width; while, being in some places double or triple, or even quadruple, they measure in aggregate length upwards of 500 miles. These works must be very ancient, for they are here and there crowned by enormous trees.

**COO′SY**—not to be confounded with the much smaller Coossy which enters the Hoogly from the right below Calcutta—is one of the largest rivers of India. It rises in lat. 28° 25′ N., and long. 86° 11′ E., on the southern slope of the Himalayas, receiving, however, at least one affluent from the northern face of that range. On emerging from the mountains, in lat. 26° 45′, and long. 87° 13′, it shews a greater volume than does the Ganges itself, in the corresponding position of Hurdwar. After a course of 325 miles in all, through the state of Nepaul and the district of Purneah, it joins the Ganges from the left, in lat. 25° 19′, and long. 87° 19′.

**COOT** (*Fulica*), a genus of birds of the order *Grallæ*, either ranked in the family *Rallidæ* (rails, crakes, &c.), or in a separate family, *Lobipedidæ*, which differs chiefly in having the toes edged with a scolloped membrane, thus making an approach to the web-footed birds. Coots have a strong, straight, and somewhat conical bill, the base of which extends up the forehead, and there dilates so as to form a remarkable naked patch. The tail is very short. They are aquatic in their habits, preferring lakes or pools with reedy margins, and retreating among the reeds on any alarm. The Common C. (*F. atra*) is found in most parts of Europe, Asia, and the north of Africa; occurring in the more northerly regions as a summer bird of passage, which is the case in the north of Scotland; although in the more southerly parts of Britain it is plentiful during winter. It is about sixteen inches long, of a black colour, with a narrow white bar across the wings, and the naked patch on the forehead pure white, from which it is often called the Bald Coot. It makes a large nest of water-plants among reeds or rushes. Although not very highly esteemed for the table, the circumstance that many can be killed by a single shot, on the mud-banks to which coots resort in winter, as on the south coast of England, makes C. shooting profitable to the fowlers who purvey for the market.—The American C. (*F. Americana*), a very similar species, is found in all parts of North America, from the West Indies to the Saskatchewan.



Common Coot (*Fulica atra*).

**COO′TEHILL**, a town in the north-east of Cavan county, Ireland, on the Cootehill, an affluent of the Annalee, 28 miles west-north-west of Dundalk. It consists chiefly of four wide streets, and is situated at the west end of a series of lakes navigable for about 7 miles to the east to near Ballybay. It has a trade in linen. Pop. 3206.

**CO′PÄIS**, LAKE. See BŒOTIA.

**COPAI′VA**, or **COPAIBA**, BALSAM OF, a valuable medicinal substance, consisting chiefly of a resin (*Resin of Copaiva*) and a volatile oil (*Oil of Copaiva*). It flows from incisions made in the stems of trees of the genus *Copaifera*, trees with pinnate leaves, of the natural order *Leguminosæ*, sub-order *Cæsalpinieæ*, natives of the tropical parts of America. It has a peculiar, not disagreeable odour, and an acrid taste. It has stimulant properties, is diuretic when taken in small doses, aperient in larger doses; but is principally useful from its powerful action on the mucous membranes. It is much used in affections

Balsam of Copaiva Tree.

of the urino-genital system, and is also employed in chronic catarrhs, &c. Balsam of C. is not unfrequently adulterated with castor oil. The Wood Oil (q. v.) or Gurgina Balsam of India, the produce of a species of *Dipterocarpus*, is sometimes sold in Britain as balsam of copaiva.

**CO'PAL**, a resinous substance used for a variety of purposes in the arts. It appears in commerce in smooth rounded masses, colourless or lemon-yellow, translucent or transparent, rather brittle, and in a cold state, almost without smell or taste. It is readily fusible and inflammable, is insoluble in water, and only partially soluble in alcohol and oil of turpentine, but becomes entirely soluble in them when it has been for a short time melted. Various useful pale-yellow or almost colourless varnishes and lackers are made of melted C. and alcohol, oil of turpentine, or boiled linseed oil.

C. is said to be a general Mexican name for resins or gums, and the C. of commerce was perhaps originally brought from Mexico. C. is also obtained in Africa, Brazil, Madagascar, and India. Mexican C. is now believed to be the produce of a species of *Hymenæa*, a tree of the natural order *Leguminosæ*, sub-order *Cæsalpinieæ*. *Vateria Indica*, a large tree of the natural order *Dipteraceæ*, yields the C. of India, very nearly resembling true C. in its properties, but also sometimes called Gum Animé (q. v.) in British commerce.—A mineral substance resembling C., and therefore called *Fossil C.* or *Copaline*, is found in some places, as at Highgate, near London, from which it is called *Highgate Resin.*

**COPA'LCHE BARK**, a bark resembling Cascarilla Bark (q. v.) in its properties, and produced by shrubs of the same genus, *Croton pseudo-china* and *C. suberosum* (see CROTON), natives of Mexico. The former yields a variety in small quills; that produced by the latter is in larger quills, and has a corky epidermis. C. B. is much used as a substitute for *Cinchona* in the cure of intermittents in Mexico, and is imported, although not to a large extent, into Europe.

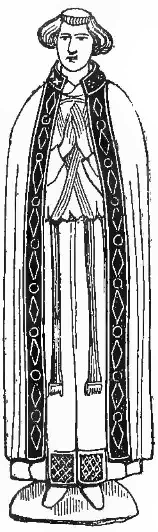
**COPALM.** See LIQUIDAMBER.

**COPA'N**, a ruined city of Guatemala, in Central America, about 30 miles to the east of Chiquimula. It stands on a stream of its own name, an affluent of the Motagua. The remains, extending about two miles along the river, comprise a temple of 624 feet in length, various pyramidal structures and sculptured idols similar to those of Egypt and India.

**COPA'RCENARY.** An estate in England originating in descent to two or more persons, called thence coparcenars or parcenars. It generally arises under the rule of law which makes the daughters of one dying without male heirs inherit equally, but it may also arise by local custom, as in the case of Gavelkind (q. v.). Although the property remains unsevered, yet each parcenar is entitled to a distinct share of it, and consequently there is no benefit of survivorship, but the right of each descends to his or her heirs, who are still called coparcenars with the surviving original parcenars. The rule of descent is also *per stirpes*, so that the heirs of one who has predeceased the common ancestor take only the share which would have come to their immediate ancestor had he or she survived, and thus a grandson of the common ancestor will also exclude his own sisters. If one of the coparcenars alienates his share, the C. is destroyed, and the estate becomes a tenancy in common (q. v.). C. may also be destroyed by partition, when the estates become in severalty (q. v.). This may be effected either by voluntary agreement, or by a suit in Chancery. Such parts of the property as cannot be divided (such as the manor-house, &c.), pass to the eldest sister or her issue, but an equivalent in value is assigned to the remaining sisters. An Advowson (q. v.) is exercised in turns, according to seniority. If the estates in C. are by descent reunited in one person, they become again an estate in severalty.

**COPA'RTNERY.** See PARTNERSHIP.

**COPE**, an ecclesiastical vestment, worn during the celebration of mass, at processions, vespers, and other solemnities. The C. was originally a cloak worn for ordinary purposes. In form it is a semicircle, without sleeves and with a hood. It is fastened across the breast with a clasp or morse. Copes soon began to be ornamented with embroidery, and even with jewels; and so early as the 13th c. they became the most magnificent and costly of all the vestments of the priesthood.


Cope.

**COPE**, a custom or tribute due to the crown, or lord of the soil, out of the lead-mines in Derbyshire.

**COPE, SIR JOHN**, an English general of the first half of the 18th c., is known through his ignominious defeat at the battle of Prestonpans by the Highlanders, under Prince Charles Edward Stuart, September 21, 1745, and more widely through a sarcastic Jacobite song.

**CO'PEC**, a Russian coin, the oldest kind in Russia, and the first substitute for furs as a medium of exchange. The name is derived from the Russian word for a lance, St George and his lance having anciently figured on the coin. Copecs were originally coined of silver alone, but copper copecs were afterwards introduced. The present C. is the hundredth part of a silver ruble, which is worth 3*s.* 1½*d.* sterling.

**COPENHA'GEN** (Dan. *Kjöbenhavn*, Ger. *Kopenhagen*, Fr. *Copenhague*, 'Merchants' Haven'), the capital of Denmark, is situated partly on the island of Zealand, in the Sound, which is here about 15 miles broad, and partly upon the island of Amager or Amak, separated from Zealand by a narrow arm of the sea, which forms a fine and capacious harbour. Lat. 55° 41′ N., long. 12° 35′ E. C. lies very low, and is strongly fortified. Its walls, flanked with bastions and surrounded by a broad deep ditch, enclose a space, including the harbour and docks, of about five English square miles. On the north-east side of the city is the immensely strong five-sided citadel of Frederikshavn, which has never yet had to surrender to an enemy. Several strong batteries also defend C. from attack by sea. The ramparts of the city and citadel, which are planted with trees, afford most delightful promenades. The population of C. amounted, in 1859, to 150,000. The city is divided into three parts, called respectively, the Old Town, or Gamle-By; the New Town, or Frederikshavn, which is divided from the old by a canal; and Christianshavn, on the isle of Amak, which is united to the rest of the town by bridges. The houses are mostly built of brick and stucco, and their general appearance is not imposing. There are, however, many fine buildings in the city, amongst which are some of the churches, the university, &c. The metropolitan church, known as 'vor Fruekirke,' is adorned with some of Thorwaldsen's noblest works—viz., a standing figure of the Saviour and the Twelve Apostles, and a kneeling angel supporting the font. The figures are of colossal size, worked in marble. C. contains several fine squares, among others 'Kongens Nytorv,' into which twelve streets open, including several of the finest in the city. The royal palace, called Christiansborg, is one of the most extensive in Europe, though its architectural character is not high. It contains, however, some noble works of art by Thorwaldsen and others. Among the other buildings of note, are the Castle of Rosenberg, where the regalia are kept, and in which are some interesting collections of objects of art, and the palace of Charlottenborg, now used as an academy of arts. The university was founded by Christian I. in 1479, but the constitution under which it at present exists bears date 1788. The number of professors amounts to about 40, and that of students to between 1000 and 1200. Amongst the professors are men of eminence in the different departments of literature and science. Connected with the university are a surgical academy, two observatories, a botanical garden, a polytechnic institution, and a library of 100,000 volumes, containing also a great collection of ancient Persian MSS., and another of ancient northern MSS. C. is the centre not only of Danish, but of northern literature and art, and is the seat of a number of societies for the advancement of these in all their branches, amongst which the most important are the Literary and Scientific Association, founded in 1742, the Academy of Arts, and the Royal Society for Northern Antiquities, founded in 1825. The royal library contains 400,000 volumes, besides great treasures of Sanscrit and other MSS., amounting in all to 15,000. The Museum of Northern Antiquities in Christiansborg is unrivalled in its kind, and contains an admirably arranged collection of *stone* weapons, ornaments, &c., to 500 B. C., bronzes to 500 A. D., and articles wrought in iron, silver, and gold to 1000 A. D., besides numerous specimens to illustrate arts and manufactures in Scandinavia during the Christian ages. There are numerous other interesting and valuable museums in connection with different departments of history and science. The arrangement of the objects in all the museums is of the most intelligent and interesting kind. The Thorwaldsen Museum, opened in 1846, consists of works of art by that sculptor himself, and others left by him to the Danish nation, for which a separate building has been erected. C. contains also a number of well-supported benevolent institutions.

Manufactures are not in a very flourishing state anywhere in Denmark, but there are produced at C. considerable quantities of woollens, porcelain, linen, and sail-cloth, tobacco, leather, &c. The trade of the place is not so great as might be expected from its situation and harbour, but it is increasing every year. The most important branches of trade are with the West India Islands, Iceland, the Faröe Isles, and Greenland.

About the middle of the 12th c., C. was an insignificant fishing-village, in the neighbourhood of which Bishop Axel, or Absalon, built a castle. He bequeathed the castle, village, and neighbouring district to the bishopric of Roeskilde. In 1254, the village obtained the privileges of a town, and in 1443 King Christopher made it the capital of the kingdom. It was several times attacked by the Hanseatic League; was besieged and bombarded by the Swedes in the 17th c.; suffered grievously by fires in 1728, 1794, and 1795; witnessed a great sea-fight in its roads on 2d April 1801, when the English, under Sir Hyde Parker, with Nelson as his second in command, were victorious over the Danish fleet; and was bombarded by the English from the 2d to the 5th of September 1807, when great destruction was wrought, both in houses and public buildings, and about 2000 persons lost their lives.

**COPERNICAN SYSTEM, The,** is that which represents the sun to be at rest in the centre, and the earth and planets to move round it in ellipses; in other words, it is that which we now know, on unquestionable evidence, to be the true system of the world. It got its name from Copernicus, but, in point of fact, it may be described as being a growth to which he was only one of many contributors. The merit of having first formed the general notion of the system seems to be due to Pythagoras; Copernicus has the credit of having, after the lapse of centuries, again drawn the attention of philosophers to it, and of having greatly increased the probability of its truth by his calculations and arguments; for the rest, the glory of having matured its idea belongs to Kepler, Galileo, and others, and to our own Newton, who, through the discovery of the law of gravitation, demonstrated its truth effectually. Many who have been used to reverence the name of Copernicus in connection with this system, would be surprised to find, on perusing his work *De Revolutionibus Orbium,* how much of error, unsound reasoning, and happy conjecture combined to secure for him in all times the association of the system with his name.

*De Revolutionibus Orbium,* dedicated to Pope Paul III., consists of six books, in which Copernicus undertook to demonstrate his whole system. The character of the reasoning which then passed for demonstration, must be borne in mind in judging of the author's procedure in establishing his various positions. It was then thought a sufficient demonstration of a phenomenon to make a supposition, on which its occurrence would be intelligible, without attempting to bring the supposition itself, by an induction of facts, within the truth of nature; many abstract propositions, too, which would now appear to be simply silly, were at that time universally admitted to be of great weight in scientific arguments.

Illustrations of both of these peculiarities may be gleaned from the first of the six books of *De Revolutionibus.* It contains the following propositions: 1. That the universe is spherical. This is established by such arguments, as that the sphere is the most perfect figure, &c. 2. That the earth is spherical, which flows from the same kind of considerations. 3. That the earth and sea make one globe. 4. That the motions of all the heavenly bodies must be uniform and circular, or compounded of uniform and circular motions. Here, again, we meet with singular reasons. A *simple* body must move circularly, and nothing but circular motion could give periodicity to phenomena. 5. That, supposing the distance of the stars to be immense, there is no reason why the earth should not have a motion round its axis as well as a motion in its orbit. 6. That the sphere of the stars is immensely distant. The proof is fanciful, and shews he had no notion of a universe of stars pervading space. 7 and 8. The ancients were wrong in placing the earth at the centre of the universe. The arguments under this head are as imaginary as those which they were designed to refute. The falling of a body to the earth he deduces from the assumption, that it is only given to wholes to move circularly, while it is of the nature of parts, separated from their wholes, to move in right lines. That there must be a *centrum mundi,* an entity unknown to modern science, is admitted, the question being as to its position. 9. It is possible for the earth to have several motions. 10. He establishes the order of the planets, and draws a diagram of the system much as it is now represented. It may be observed that, following the old systems, such as the Ptolemaic, he lays down *a sphere* for the fixed stars. (See FIRMAMENT.) It is clear, also, that he had no idea of the motions of the planets other than that they were such as would be caused by their being fixed in immense crystal spheres revolving round the sun.

The most brilliant and valuable part of the *De Revolutionibus* is that in which he explained, for the first time, the variations of the seasons, the precession of the equinoxes, and the stations and retrogradations of the planets. In general, his explanations are right, and perfect as to the general nature of the causes of the phenomena. But Copernicus had neither mathematical nor mechanical knowledge sufficient to enable him to explain more than the mean motions of the solar system. To account for irregularities, he was obliged to introduce a system of epicycles entirely resembling that of Ptolemy. See PTOLEMAIC SYSTEM. This arose from the false notion of his times, that all motions must be compounded of circular ones, with the application of which idea, and with the invention of convenient epicycles, the greater part of the *De Revolutionibus* is occupied. It may further be added, to rectify the vulgar notion regarding the relation of Copernicus to the system of the heavens, that he had no answer to offer to the mechanical objections to his system. Most of them, indeed, were such as could not possibly be met in the then state of mechanical knowledge. One of the commonest was that against the axial motion of the earth, that it was inconsistent with the fact of bodies falling to the points of the earth directly beneath the points from which they are dropped; for this he had no answer, nor could he have, the laws of motion being not yet discovered. Such being the state of the case, the reader will consider whether, when Copernicus wrote that he held the doctrine of the earth's motion as a mere hypothesis, and not as absolutely in fact true, it is more likely that he made a concession to the religious prejudices of his times, or to difficulties surrounding his hypothesis, which he could well appreciate though not overcome.

**COPERNI'CIA.** See CARNAHUBA PALM.

**COPE'RNICUS**, NICOLAS, an eminent astronomer, was born at Thorn, in Prussia, 19th February 1473. He was instructed in the Latin and Greek languages at home; afterwards he was sent to the university of Cracow, where he studied philosophy and mathematics, and also took the degree of doctor of medicine. His natural bent, however, was towards mathematics, the study of which he pursued with passion through all its branches.

Having become enamoured of the study of astronomy, he projected a journey to Rome in his enthusiastic admiration of Regiomontanus, who resided there, and was then the most illustrious of the astronomers. On his arrival he was kindly received by Regiomontanus, whom he soon rivalled in fame. Here his reputation, and the favour of his distinguished friend, led to his being chosen professor of mathematics, which he taught for several years most successfully. After several years he left Rome and returned to his native country, where, having entered into holy orders we suppose, he obtained through his uncle, the Bishop of Warmia, a canonry at Frauenburg, in the enjoyment of which he passed the rest of his life. His working-day, it is said, he divided into three parts—one of which he devoted to the duties of his office, another to giving medical advice gratuitously to the poor, and the third to study.

Soon after his return to Prussia, he began, in his 35th year (1507), to apply his fund of observations and mathematical knowledge to correcting the system of astronomy which then prevailed. The result was his *De Revolutionibus Orbium*, some account of which is given in the previous article. He completed it in 1530, in his 57th year. But though finished at this date, it was twelve years later before he could be persuaded to give his book to the world by his friends, who urged its publication out of regard at once to his fame and the interests of science. Perhaps the strongest motive for his reticence, was the fear of the unpopularity which the work threatened to bring him (for many who had heard of the views it advocated, doubted if these were in harmony with religion), while it is pretty certain that his desire to conciliate the church (which afterwards shewed in the case of Galileo what it was capable of in such a matter), led him to dedicate his book, when it was published, to Pope Paul III. It is related that the first copy of this labour of his life reached him when he was no longer able to enjoy the triumph. An attack of dysentery, followed by paralysis of the right side, had destroyed his memory and obscured his understanding. In this state he lingered several days. The copy, it is said, just arrived a few hours before he died. It was placed in his hands, and he *seemed* to know it! He died 24th May 1543, aged 70.

Besides the *De Revolutionibus*, may be mentioned among C.'s works a treatise on Trigonometry, entitled *De Lateribus et Angulis Triangulorum*, Wittemberg, 1522, 4to; and *Theophylactici Scholastici Simocattæ Epistolæ Morales, Rurales, et Amatoriæ, cum Versione Latina.* He also wrote a work on money, and several MS. treatises from his pen are said to be in the library of the bishopric of Warmia. His life has been written by Gassendi, an almost literal translation of whose work will be found in Martin's *Biographia Philosophica.*

**COPIAPO'**, a name of various application in the north of Chili, marking at once a volcano, a river, a district, a village, and a city. 1. The volcano is a peak of the Andes, in lat. 27° 32′ S. 2. The river has a westerly course of 120 miles from the Andes to the Pacific; its mouth being in lat. 27° 20′ S., and long. 71° 2′ W. 3. The district, sometimes reckoned a part of the province of Coquimbo, is rich in silver and copper; but, excepting on the immediate banks of streams, almost valueless for agricultural purposes. 4. The village, known as Port C., stands at the mouth of the river, containing about 1200 inhabitants. 5. The city built on the river, about 30 miles from the sea, has a population of about 3000. It is connected by railway with Caldera, a harbour of the republic, about 20 miles to the north of the mouth of the river. The foreign trade of the two places, which are classed together in the official returns, is rapidly increasing, as follows:

| | ENTERED. | | CLEARED. | |
|---|---|---|---|---|
| Year. | Vessels. | Tons. | Vessels. | Tons. |
| 1851, | 149 | 46,387 | 147 | 45,501 |
| 1855, | 315 | 118,488 | 319 | 119,898 |
| Increase in four years, | 166 | 72,101 | 172 | 74,397 |

**CO'PLAND**, JAMES, a living English physician, born at Deerness, in the Orkneys, in 1792. After studying medicine at Edinburgh, he travelled on the continent, and subsequently undertook a journey to Africa, to investigate the nature of epidemic diseases prevalent in tropical lands. He settled in London about 1820, and was made a member of the Royal College of Physicians. In 1822, he undertook the editorship of the *London Medical Repository;* and being chosen in that year to deliver the annual oration of the London Medical Association, he in his lecture advanced a new theory of electro-galvanism. His *Outlines of Pathology and Practical Medicine*, in which he especially treated of the ganglionic nerves and their functions, and proposed a new and more simple classification of diseases, appeared in 1822, and the *Elements of Physiology* in 1824. But C.'s most important work is the *Dictionary of Practical Medicine*, to which he devoted the labour of many years (Lond. 1830—1858, 3 vols.). This comprehensive work has attained an extensive reputation in America and Germany as well as in England. The views given in his essay on *Pestilential Cholera*, published in 1832, when the cholera first appeared in Britain, have been confirmed by experience. He has also published, besides various contributions to medical periodicals, a treatise on Palsy and Apoplexy, and, in connection with Dr Annesley, one *On the Diseases of Warm Climates.*

**CO'PLEY**, John Singleton, the father of the present Lord Lyndhurst, and a historical painter of some note, was born at Boston in the United States, July 3, 1737. In 1774 he came to England, and after a visit to Italy, settled permanently in London. In 1783 he was elected a member of the Royal Academy, and died in 1815. C.'s best work is the 'Death of Lord Chatham,' now in the national collection. Besides it, may be mentioned his 'King Charles Ordering the Arrest of the Five Members of Parliament,' the 'Death of Major Pierson,' the 'Assassination of Buckingham,' and 'King Charles Signing Strafford's Death Warrant.'

**CO'PPER** is one of the most anciently known metals, and its name is derived from the island of Cyprus, where it was first obtained by the Greeks. In the earlier times, C. does not appear to have been employed by itself, but always in admixture with other metals, principally tin, forming what is now called bronze (q. v.). There is every reason to believe, that next to the large quantities of tin which they obtained, one of the great inducements which the Phœnicians had in making searches for metals in Great Britain, was the C. which they procured in their workings in Cornwall.

C. is sometimes met with in nature in a state of purity, but generally it is associated with oxygen, water, and carbonic acid, forming the native carbonate of C. or *malachite* ($CuO,HO + CuO,CO_2$), or with iron and sulphur, forming the native sulphurets of C. and iron or *C. pyrites* ($Cu_2S,Fe_2S_3$). In smaller quantity, C. occurs as the oxide ($CuO$), and sulphate ($CuOSO_3$), and in all cases the ore is obtained from fissures or veins in other rocks. The principal yield of C. ore in Great Britain is from the mines in Cornwall, but large supplies are also obtained from Australia, and from Cuba and Chili in South America. In North America, in the neighbourhood of Lake Superior, C. ore occurs abundantly, and a vein of metallic C. is there found which in some places is about two feet in thickness.

In the extraction of C. from its ores, the metallurgic processes followed are very tedious and complicated, which mainly arises from the difficulty of separating the iron and sulphur from the copper. The general principle which regulates the working-up of the ore is to burn away the sulphur (S) as sulphurous acid ($SO_2$), and to carry off the iron by means of fluxes in the form of scoriæ or slag. Metallurgists enumerate ten distinct steps in the production of commercially pure copper.

C. (symbol *Cu*, from Lat. *cuprum*) has the equivalent 31·65. It is the only red metal, has the specific gravity 8·78 when cast, and 8·96 when rolled or hammered; fuses at 1996° F. (Daniell), and at a white heat passes off in vapour, and burns with a green flame. It is very malleable, and can thus be beaten out into thin leaves; is very ductile, so as to admit of being drawn out into thin wires; and its tenacity is only inferior to that of iron. It is a powerful conductor of electricity, and hence is employed in the construction of lightning-conductors, and in telegraph-wires for underground or submarine communication. C. is also employed largely in the sheathing of wooden vessels, and in the coinage. See also Alloy.

C. forms many compounds. There are two oxides, the black oxide ($CuO$) and the red oxide ($Cu_2O$). The latter is employed in colouring glass of a ruby-red tint. The *green rust* which forms on the surface of a C.-sheathed ship, and on C. coins and vessels which lie in moist places for some time, is a carbonate of C., and is due to the carbonic acid and oxygen of the air acting upon the C. in the presence of moisture. It is very poisonous, and hence any barnacles which may attach themselves to the C. sheathing are poisoned. The carbonate of C., under the name of *blue verditer*, is largely prepared and sold as a pigment. The subchloride of C., moistened and exposed to the air, yields the pigment known as *Brunswick green*. There are several compounds obtained by allowing acetic acid to act upon oxide of C., which are commercially called *blue* and *green verdigris*. The sulphate of C., or *blue vitriol* ($CuO,SO_3 + 5HO$), is prepared by dissolving the black oxide in sulphuric acid, and allowing the salt to crystallise out. The crystals are large, and present a fine blue colour. It is soluble in water, and is extensively used by the dyer and calico-printer for the production of several blue and green colours. The solution of blue vitriol is also employed in the preservation of timber from dry rot, and it forms a constituent of some writing inks.

*Mineralogy.*—Native C. is not of very rare occurrence; it is sometimes massive, or in grains, plates, &c.; sometimes crystallised in cubes or octahedrons; sometimes it assumes dendritic and other beautiful forms. Great masses of native C. have been found both in North and South America.—What are called C. ores in commerce, generally consist of the true ore disseminated through rock, and are therefore very variable in productiveness. A C. schist is profitably wrought at Mansfeldt, in Germany, although it yields only one per cent. of copper. Among the most plentiful and valuable C. ores is the *C. Pyrites* already mentioned, or *Yellow C. Ore;* but there is a richer ore called *Purple C.* or *Variegated C.*, or *Bornite*, also a compound of sulphur, C., and iron. *Malachite* and *Azurite*, both consisting essentially of carbonate of C., are valuable ores; as are some ores which are essentially composed of oxygen and C., particularly *Red C. Ore* (*Cuprite*) and *Black C. Ore* (*Tenorite*). Some ores of C. contain also silver, and some contain arsenic, antimony, &c. *Gray C. Ore* is very compound, containing silver, mercury, zinc, antimony, arsenic, iron, and sulphur. *Atacamite*, wrought as an ore of C. in South America, is composed of chloride of C. and hydrochlorate of copper.

**COPPER I'NDIGO** is an ore of copper found in spheroidal masses, of an indigo-blue colour, in Thuringia and Vesuvius, and is very nearly pure sulphuret of copper. Its composition in 100 parts, is copper, $64\frac{3}{4}$; sulphur, $32\frac{3}{4}$; iron, $\frac{1}{2}$; and lead, 1.

**CO'PPERAS** is the commercial term for the sulphate of iron. See Iron.

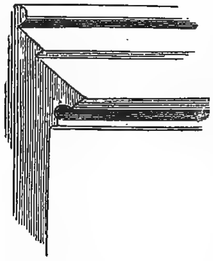
**COPPERED, COPPERING**, in Ship-building, are terms used in reference to the sheathing applied to the bottom. The copper employed for this purpose is in the form of sheets, varying from 18 to 32 ounces per square foot, and usually measuring 48 inches by 14. A layer of felt, paper, or coarse linen, is first applied to the planking; and the copper is nailed down upon it. So much of the bottom as is immersed in the water is thus covered. The timbers are by this means protected from molluscs, cirrhopods, and weeds; and consequently the ship can sail quicker than if no such sheathing were applied. Some builders copper their ships up to the load-water line, while others go no higher than the light-load line; there being a difference of opinion whether the intermediate space, sometimes dry and sometimes wet, ought to expose a wood or a copper surface.

A *copper-bottomed* ship always ranks better at Lloyd's than one not so sheathed. The same is the case with a ship said to be *copper-fastened;* i. e., in which bolts of copper are used instead of iron in those parts of the ship immersed in water. Ships can be insured at a lower premium when thus provided.

**CO'PPERMINE RIVER**—so named, in common with the mountains to the west of it, from the metallic products of the vicinity—enters a bay of the Arctic Ocean about lat. 68° N., and long. 116° W. Its overland discovery by Lieutenant Hearne, then of the Hudson's Bay Company's service, in June 1771, excited considerable interest, as incontestably proving that the supposed Strait of Anian, whatever might be the truth as to its westward terminus, had its eastward outlet, if any, only in the Icy Sea. The C. R. rises near a feeder of Great Bear Lake, which itself is tributary to the Mackenzie —the former of the diverging water-courses taking a vastly shorter route to the coast than the latter. Hence the C. R. is throughout little better than a series of falls and torrents, being thus, even without regard to its isolated position, but little available in itself for navigation.

**CO'PPERPLATE PRINTING.** See PRINTING.

**CO'PROLITES** (from Gr. *kopros*, dung, and *lithos*, a stone), are the fossilised excrements of animals found in the Secondary and Tertiary strata of the earth's crust. Their true nature was first inferred from their occurrence in the bodies of several species of *Ichthyosaurus*, in the region where was situated the intestinal tube. It has been since shewn that they are the voidings chiefly of saurians and of sauroid fishes. They often contain portions of scales, bone, teeth, and shells, the indigestible parts of the food on which the animals lived. Occasionally, they may be found exhibiting the spiral twisting and other marks produced by the conformation of the intestinal tube, similar to what is noticed in the excrement of some living fishes. These peculiar markings obtained for them the name, when their true nature was unknown, of 'larch-cones' and 'bezoar-stones.' C. are found to contain a large quantity of phosphate of lime; and as this forms a valuable manure, the deposits containing them have been of late years largely quarried by the manufacturers of artificial manures.


Coping.

**COPS, COPING** (Anglo-Sax. *cop*, Ger. *kopf*, the head). The merlons or rising parts of battlements are sometimes called cops, but the term coping is usually applied to the covering course of a wall, which is made either sloping or round, so as to throw off water. Where the coping is of hewn stone, it is frequently ornamented with a circular moulding running along the top, and sometimes the angle at the top is simply taken off, to prevent it from being chipped.

**COPSE, or CO'PPICE**, a natural wood or plantation, of which the trees are cut over from time to time, without being allowed to attain the size of timber trees, sending up new shoots from their roots or stools. Some kinds of trees—as the firs—are incapable of being treated in this manner, refusing to send up new shoots; but many—as the oak, birch, chestnut, ash, elm, maple, alder, hazel, and willow—very readily do so, at least if they have not been allowed to attain too considerable a size before being cut over. C.-woods are sometimes planted chiefly to vary and beautify the landscape, but more generally with a view to profit, either owing to great local demand for their produce, or to peculiarities of soil and situation. It often happens, that owing to scantiness of soil or to unfavourable subsoil, oaks and other trees, after growing vigorously for a number of years, are arrested, and remain almost stationary in their growth. In such circumstances, it is advantageous to cut them over early, and to treat the plantation as a C., the former vigour being again manifested in the young shoots, and the land yielding in this way a greater return to its owner. Oak is much planted as C.-wood, in consequence of the demand for its bark: in some parts of Herefordshire, the trees are cut over every twelve years; but in the Highlands of Scotland, twenty-five or thirty years are often necessary for sufficient growth, nor is the bark thought to have attained its highest perfection till the stems are of this age. The largest pieces of the wood are used for making wheel-spokes, and for other purposes of timber; the smaller portions for charcoal, and firewood. Ash is sometimes planted as C., with a view to the employment of the wood for handles of implements, hurdles, hoops, &c., the wood of the ash, even when very young, being highly valued for strength and elasticity. Chestnut copses are planted in England to supply hop-poles. Hazel is a very common C.-wood, being in great demand for making crates, &c. Besides the cultivation of different kinds of willow or osier for basket-making, in which they are cut over annually, some of the species are cultivated as C., and cut every five, six, or seven years, for hoops, crates, &c.; the species which is deemed most suitable of all being *Salix caprea.* See WILLOW. In some countries, C.-wood is particularly valued for the regular supply of fuel which it affords.

In cutting C.-wood, care is taken to dress the stools so that water may not lodge in them and cause them to rot. The size to which the stems are allowed to attain before being cut, and the frequency of cutting, differ according to the different kinds, and the uses intended. Stems more than four inches thick are generally cut with the saw, but smaller stems with a curved bill, cutting upwards. Extensive copses are sometimes divided into portions, of which one is cut every year.

**CO'PTIS**, a genus of plants of the natural order *Ranunculaceæ. C. trifoliata* is a native of the north of Europe, Siberia, Greenland, Iceland, and North America. It grows in swamps. From its long, thread-like, golden-yellow rhizomes, it derives the name of *Golden Thread.* Its leaves have three wedge-shaped leaflets, and its leafless stems bear each a solitary, rather pretty white flower.

**COPTS**, the Christian descendants of the ancient Egyptians. Various derivations have been given of the name, which, however, is most probably from the same root as E-*gypt.* The C. are in number about 150,000, only about a fourteenth of the population of the country. There are about 10,000 of them in Cairo. They are not of great stature, have black eyes, and rather curly hair, and in a number of points resemble the ancient Egyptians, from whom also they have inherited the custom of circumcision. They dress like the Moslems, but are generally distinguished by a black turban. Their character is in general gloomy, deceitful, and avaricious. They are very expert in calculations, and are therefore much employed as accountants and book-keepers, by which they have acquired a great influence in the country, filling very important posts. In religion they are generally monophysites (q. v.) of the Jacobite sect; smaller sections of them, however, are united to the Greek and Roman Catholic churches. They ascribe their conversion from heathenism to St Mark, whom they regard as the first patriarch of Alexandria. Their highest dignitary is the patriarch of Alexandria, whose residence, however, is in Cairo. Their other orders of clergy are bishops, archpriests, priests, deacons, and monks. The patriarch is named by his predecessor from among the monks of the convent of St Anthony, or chosen from among them by lot. He is not permitted to marry. He nominates the Metropolitan of Abyssinia. See ABYSSINIA. There are twelve bishops. The C. are very strict in their religious observances, and hate other Christian sects even more than they hate the Moslems. They baptise by immersion; practise unction, exorcism, and auricular confession; and celebrate the Lord's Supper with leavened bread which has been dipped in wine. They keep Friday with great strictness as a fast-day. They have many schools, but only for boys, who learn the Psalms, Gospels, and Apostolic Epistles in Arabic, and then the Gospels and Epistles in Coptic. The Coptic, however, is not grammatically taught, and is not now a spoken language, having been everywhere supplanted by the Arabic. It has not been spoken in Lower Egypt since the 10th c., but lingered for some centuries longer in Upper Egypt. It is, however, still used by the C. in their religious services, but the lessons, after being read in Coptic, are explained in Arabic. The Coptic literature consists in great part of lives of saints and homilies, with a few Gnostic works. The alphabet was borrowed from the Greeks at the time of the introduction of Christianity, with the addition of a few letters. There are two principal dialects of the language—the Sahidic or Upper Egyptian, and the Memphitic or Lower Egyptian, which is sometimes exclusively called Coptic. A third dialect, the Bashmuric, of which only a few remains exist, was spoken in the Delta, and is interesting from its points of resemblance to the language of the hieroglyphics.

**CO'PULA** (Lat. band) is a term employed in Logic to designate the word which unites the two notions of a sentence—viz., the subject and predicate into one judgment or thought. Thus, in the sentence, 'Art is long,' *art* is the subject, *long* the predicate, and *is* the copula. The C. is either expressed apart by some part of the verb 'to be,' as in the above sentence, or it is contained in the word expressing the predicate—as, 'The flower blooms'—i. e., *is* blooming.

**CO'PY**, in the Fine Arts, is a reproduction of a work, whether painting, statue, or engraving, not by the original artist. A C. made by the master himself is called a repetition (in French, a *doublette*). It is said that copies are of three degrees: first, where the original is mechanically imitated in its minutest details (this is always done when an engraving is to be obtained); second, where only the principal traits are imitated; and, third, where the general idea merely is borrowed. A C. of a statue, or other piece of sculpture, taken from a mould, is not called a C., but a *Cast* (q. v.).

**CO'PYHOLD**, a species of estate or right of property in land, peculiar to the law of England, although resembling in many particulars the feu-rights of Scotland. C. is expressed technically as 'tenure by copy of court-roll, at the will of the lord, according to the custom of the manor.' This means, that it is tenure of land, being part of a manor, the title being evidenced by the court-rolls of the manor, and the right of the owner being in conformity with the immemorial customs of the manor. The addition, 'at the will of the lord,' serves only as a memorial of the derivation of this species of estate from the estates granted in old times to the bondsmen, or *Villeins* (q. v.), which were of course resumable at the pleasure of the lord. But the will of the lord is now absolutely controlled by the custom of the manor, which forms the law of the tenure; and as this custom must be immemorial, i. e., extending to the reign of Richard II., no C. can now be created.

The custom of each manor may vary in important particulars. In some, the C. lands are held for life only; in some, they descend according to particular rules of their own; in most, however, they descend according to the ordinary rules of succession. But the custom, whatever it may be, cannot be altered by the holder of the C.; he cannot, for instance, entail his land unless the custom warrants him.

An important point, also dependent entirely upon special custom, is the amount of the money-payments due by the copyholder to the lord of the manor. These are divided into *quit-rents*, an annual payment of the nature of the Scottish feu-duty; *fines*, payments on particular occasions, such as alienation or succession; and *heriots*, or the best piece of personal property, to which, on the death of the copyholder, the lord becomes entitled. As to fines, it may be observed, that the custom may either fix the amount, or it may leave them to be at the pleasure of the lord; but as the courts of law require that all customs, even when indefinite, shall be reasonable, they have fixed the extreme amount that can be exacted at two years' rent of the land.

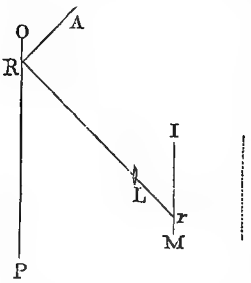
The practical distinction of most importance, however, between freehold and C. land, is the mode in which it must be conveyed. An ordinary conveyance is ineffectual in regard to C., and indeed would operate, like other attempts to break through the custom which forms the title, as a forfeiture. The course adopted is almost identical with the Scottish *resignation*. The owner comes to the steward of the manor, and by a symbolical delivery, according as the custom may prescribe, surrenders the land to the lord of the manor, in order that it may be granted again to such person, and on such terms as are desired, and as the custom authorises. The steward, by a repetition of the symbolical delivery, transfers the C. to the person in question, in terms of the surrender; and he then pays the customary fine, and takes the oath of fealty. This is called conveyance by surrender and admittance. In the case of an heir succeeding, there is no surrender, but there is admittance only upon payment of the customary fine, and it is enforced by a customary penalty. A mortgage is effected by a surrender, upon condition that the money is repaid, and the admittance takes place only in event of failure of payment. A C. may, in like manner, be devised by will, the devisee being admitted on the death of the devisor. On the same principles are effected a conveyance to trustees, and a conveyance by a tenant in tail, so as to bar the entail.

The inconveniences and loss accruing through the variety of customs to which C. lands are subject, have led the legislature to make provision for their gradual extinction. A Board is established, under whose authority all the services due to the lord of the manor may be commuted for a fixed rent. The lord of every manor is also authorised to enfranchise, or convert into freehold, the C. lands by agreement with their owners. And after the next admittance subsequent to 1st July 1853, either the lord or the tenant so admitted may compel enfranchisement on payment, either of a fixed sum, where it is at the instance of the lord, or of an annual rent, where it is at the instance of the tenant, fixed in both cases by the commissioners.

**COPYING**, a term applied in Photography to the reproduction of paintings, engravings, manuscripts, maps, &c. The kinds of camera and lens most suitable for the purpose, will be found described under their respective heads; the quality and condition of chemicals necessary are based upon the facts, that long exposure is almost invariably required, and that, in the majority of cases, it is desired to copy black marks upon a white ground, as in a sheet of music, for example. Where it is obvious that nothing that can be called a middle tint is required, but simply pure black and white, recourse should be had to organic matter in the bath; a little acetate of soda, and an extra amount of acetic acid, may be also added, and an old collodion containing free iodine employed.

It is important that the work or surface to be copied should be placed in a strong light, and exactly at right angles to the axis of the lens, which should be furnished with a *small* stop. These three conditions, it will be seen, are such as are calculated to insure density in the blacks of the negative, freedom from distortion, and sharpness at the edges of the picture. The copying of oil-paintings seems to the amateur, at first sight, to present almost insuperable difficulties, on account of the reflected light from the varnish passing through the lens, and producing black patches on the negative. This may, however, be completely avoided by the employment of a lens of long focus, which admits of the oblique pencils of light passing off without entering the camera.

This will become more intelligible by reference to the following diagram, in which OP is supposed to be an oil-painting, L the lens, and IM the image. Let A be a ray of light, incident at R; reflection at the varnished surface will cause it to pass through the lens, and come to a focus on the sensitive surface at *r*, causing an increased action at that point, resulting in a black patch. If, however, a lens of longer focus be employed, and the camera be moved further from the picture (as it must be to obtain the same sized image), as shewn by the dotted line, it will be seen that no reflected rays can fall upon the sensitive plate, but that they will all pass beyond the field of view.



Attention to the laws of the reflection of light, will suggest to the reader the importance also of avoiding a bright light immediately behind the camera, as the rays of light would then fall on the varnished surface, nearly at right angles, and be reflected into the camera. The oil-painting, therefore, though placed in strong sunshine, for the purpose of giving vigour to the more obscure parts, should be so arranged as to allow the light to fall on it at an angle of about 35° or 40°.

In copying transparent negatives, a somewhat different arrangement is required, as will appear from considering the following facts. Every object to be copied may be regarded, for the sake of illustration, as an assemblage of bright points, from each of which divergent pencils of rays are reflected, and suffer refraction on passing through the lens; an engraving or oil-painting is, in fact, in its relation to the sensitive surface, the *source of light*. In a negative, however, many of the parts of which are transparent glass, it is manifest the case is different, for if we suppose the sun or a luminous background to be placed behind the negative, *that* will act as the source of light, and any rays coming therefrom will pass almost directly through those parts of the negative which are bare glass, to the lens; thus producing the same effect as if the transparent parts were opaque, but luminous, and emitted divergent pencils of light. It is necessary, therefore, that the rays should be made to intersect at those points where bare glass exists, and this may be accomplished by employing what is called a condensing lens, by which means negatives may be most successfully copied, by placing an artificial light behind it, or still better, by reflected sunshine through it.

Negatives are sometimes copied on glass by direct superposition in the ordinary pressure-frame, such as is used for printing photographs on paper, in which case, dry plates are used, prepared either by the albumen or collodio-albumen process; and the latent image so obtained yields a transparent positive when developed by gallic or pyro-gallic acid.

**COPYING-MACHINES**. The various contrivances for procuring duplicates of writings without the labour of transcribing them, may be reduced to two classes. In the one, the writing is first made, and then copied; in the other, the copy and the original are produced at the same time. The essence of the first method is this:—In writing the original, an ink is used that is made for the purpose, or common ink thickened by the addition of a little sugar. When the writing is dry, a damped sheet of thin unsized paper is laid upon it, and over this a piece of oiled paper. The whole is then subjected to pressure, and the damped paper is found to have taken off an impression of the writing. It is of course the reverse of the original, but the nature of the paper allows it to be read right on the other side. The machines for communicating the pressure are of various kinds. Some pass the sheets between rollers like the copper-plate press; others act on the principle of the common printing-press. A simple plan is to wrap the sheets round a wooden roller of about an inch diameter, lay this upon a table, and roll it under a flat board, pressing all the while. Another very common method of copying, is by means of prepared blackened paper laid between two sheets of thin writing-paper. The writing is traced firmly on the upper sheet, with a steel or agate point, or common black-lead pencil, and the lines are found transferred in black from the blackened sheet to the paper adjacent. By having several of these blackened leaves, a number of copies may be produced at once. The blackened paper is prepared by saturating it with a mixture of lard and lampblack, and cleaning it so far that it will not soil paper unless pressed against it.

**CO'PYRIGHT**, an author's exclusive right of property in any work which he writes, and which, under certain limitations, is transferable to his heirs and assigns. Such is the chief or general meaning of the term, which now, however, embraces several varieties of right; and these, from the importance of the subject, we propose to consider separately.

*Books.*—The idea of a right of property in literary composition is of modern origin. Nothing is heard of C. previous to the invention of printing, nor for a long time afterwards. In ancient and mediæval times, books appear to have been transcribed freely by other parties than their authors, and as freely disposed of, often at great prices. After the introduction of printing, the liberty to publish books became the subject of licences and patents; and these privileges may be said to have constituted a special monopoly of the nature of copyright. In the absence of any licence or protection of this kind, authors could only resort to the common law to vindicate their real or fancied rights. But the common law of England was silent on the subject. There were serious differences of opinion among lawyers as to the availableness of an exclusive right in literary composition, viewing it as a chattel or thing that could be held, inherited, or assigned. How, it was asked, could ideas, or the way of writing a narrative, be made property? Supposing, however, that a certain structure of ideas and written words could be invested with the quality of property, it was reasonable to conclude that the property should be absolute and perpetual to the owner, his heirs and successors. Such being the case, it would be proper for the heirs of Shakspeare, Milton, Bunyan, and other literary luminaries of past times, to claim possession of the works of their respective ancestors; leaving them, of course, the right either to maintain a monopoly, or to suppress the works altogether. Such were the questions that puzzled the English jurists of the early part of the 18th c. A compromise appears to have been made. No decision was come to, as to whether literary composition was property in the ordinary sense of the word. Yet, looking at it as a thing on which thought and labour had been expended, and professedly 'for the encouragement of learning,' it was deemed worthy of legal protection for at least a period limited by considerations of public policy. An act of parliament was accordingly passed on the subject in 1709.*

This, the first C. act, 8 Anne, c. 19, sets out as follows: 'Whereas printers, booksellers, and other persons have of late frequently taken the liberty of printing, reprinting, and publishing, or causing to be printed, reprinted, and published, books and other writings, without the consent of the authors or proprietors of such books and writings, to their very great detriment, and too often to the ruin of them and their families: for preventing, therefore, such practices for the future, and for the encouragement of learned men to compose and write useful books, may it,' &c. The chief provisions of the act were, (1.) That authors who, after April 10, 1710, had not sold their C. of works in print, were to have the sole right of printing them for 21 years; (2.) Authors of books not printed and published, and their assignee or assigns, to have the sole liberty of printing and reprinting such book and books for the term of 14 years, to commence from the day of the first publishing the same; (3.) After the expiration of the said term of 14 years, the sole right of printing or disposing of copies to return to the authors, if they were then living, for another term of 14 years.

Under this act, authors disposed of the C. of their works for the specified period, at the end of which, 28 years at most, the C. lapsed. Although the works might then have been considered public property, a custom arose among publishers of not interfering with each other's lapsed copyrights; and in a sense each assumed a kind of perpetual monopoly of the works which he had purchased for a terminable period. So stood matters, when Alexander Donaldson, an Edinburgh bookseller, of whom some notice has been taken in the article Book-trade, broke through the conventional regulations, by issuing cheap reprints of works out of copyright. There ensued a litigation, of which it is necessary to present some details. At divers times in 1729, James Thomson sold the C. of his *Seasons* and other poems to Andrew Millar, a London bookseller, for sums amounting to £242, 10*s.* Thomson died in 1748. According to the Act 8 Anne, c. 19, the utmost length to which the C. of these works could be extended was 28 years, which terminated in 1757. Millar died in 1768, and his executors, in 1769, sold by auction the C. of the works in question for £505. The purchasers were 'Beckett and others.' This sale was, in reality, an imposition; for, as just mentioned, the C. had expired in 1757. Aware of this fact, Donaldson, in 1768, issued a cheap edition of Thomson's *Seasons.* He was now challenged for an invasion of C.; and in 1771, Beckett and others applied for, and procured, an injunction from the Court of Chancery to restrain him from further printing and selling the work, and to make him answerable for the profits he had already realised. The only explanation of this extraordinary proceeding is, that the applicants for the injunction imagined that at common law they had acquired a property in Thomson's *Seasons* in all time coming. The question at issue was nothing less than the creation of perpetual monopolies in literature—not for the benefit of authors and their families, but for certain publishers and their assigns. The notion of a common-law right had prevailed in granting the injunction, and the validity of such a notion was now for ever to be determined. Donaldson appealed to the House of Lords. The chief points pressed for consideration were, whether at common law an author had the sole right of printing his works, and whether, possessing a right of that kind, it was taken away by the statute 8 Anne, c. 19. The Lords differed in their opinion, but the decision finally come to was, that any right at common law was impeached and taken away by the statute; and the decree of the Court of Chancery was accordingly reversed. See Brown's *Parliamentary Cases*, vol. ii., p. 136. By this famed decision, it was settled that claims of C. rest altogether on the statute and its interpretations. Ever since, any one is at liberty to print and sell works of which the statutory term of C. has expired; on the simple ground, that all such works are public property.

The C. law did not extend to Ireland till after the union with that country, when (1801) the whole United Kingdom was included by the Act 41 Geo.

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* Until this act came into operation, the law of Scotland, as regards copyright, had been as defective as that of England. Under date November 9, 1699, the following occurs in the *Domestic Annals of Scotland*, by R. Chambers, vol. iii.: 'It was customary for the Lords of Privy Council to grant exclusive right to print and vend books for certain terms—being all that then existed as equivalent to our modern idea of copyright. Most generally, this right was given to booksellers and printers, and bore reference rather to the mercantile venture involved in the expense of producing the book, than to any idea of a reward for authorcraft. Quite in conformity with this old view of literary rights, the Council now conferred on George Mossman, stationer in Edinburgh, "warrant to print and sell the works of the learned Mr George Buchanan, in ane volume in folio, or by parts in lesser volumes," and discharged "all others to print, import, or sell, the whole or any part of the said Mr George his works in any volume or character, for the space of nineteen years."' Some other instances of the same kind are given, making it clear that in these times books could not be printed in Scotland without authority from the Privy Council.

III. c. 107. Previous to this time, many of the most saleable of the British C. works were freely reprinted in Dublin, and occasionally found their way across the channel to the annoyance of English authors and publishers. The next act concerning copyrights was that of 54 Geo. III. c. 156, in 1814, by which the period of C., instead of being 14 years, and contingently for 14 years more, was fixed to be 28 years certain, and for the residue of an author's life, if he were living at the end of the 28 years.

The impetus given to literature during the early part of the present century, by the popular and voluminous writings of Scott, Byron, Moore, Wordsworth, and others, along with the growing taste for reading among the middle and less affluent classes, greatly increased the market value of C. in every species of literary production. As a natural consequence, that kind of disinterestedness so strikingly demonstrated in Robert Burns, who could hardly be prevailed on to accept a few pounds complimentarily in requital for hundreds of the most beautiful lyrics, was no longer seen; on the contrary, it became a recognised principle that an author was entitled to regard the product of his brain as purely a mercantile commodity. At length, under an impulse communicated by the assigns of some valuable copyrights about to expire, and on the assumption of benefiting the families of certain popular writers, the legislature was induced to extend the term of copyright.

By the Act 5 and 6 Vict. c. 45, called Talfourd's or Lord Mahon's act, 1st July 1842, the term of C. was extended as follows: 'And be it enacted that the copyright in every book which shall after the passing of this act be published in the lifetime of its author shall endure for the natural life of such author, and for the further term of seven years, commencing at the time of his death, and shall be the property of such author and his assigns: provided always, that if the said term of seven years shall expire before the end of 42 years from the first publication of such book, the copyright shall in that case endure for such period of 42 years; and that the copyright in every book which shall be published after the death of its author shall endure for the term of 42 years from the first publication thereof, and shall be the property of the proprietor of the author's manuscript from which such books shall be first published, and his assigns.' In the case of subsisting copyrights, the term was to be extended to 42 years, except when they belonged to an assignee for other consideration than natural love and affection; in which case they were to cease at the expiration of the 28 years, unless their extension were agreed to between the proprietor and author. In this act, there is a remarkable clause giving power to the Judicial Committee of the Privy Council to license the publication of books of importance, which the proprietor refuses to republish after the death of the author. Formerly, there was an obligation on publishers to deliver 11 copies of new works to certain universities and other public institutions; the obligation was now modified to 5 copies. The importation of English C. works printed in foreign countries is prohibited. C. is declared to be personal property, and may be bequeathed as such; in case of intestacy, it is to be subject to the same law of distribution as other personal or movable estate. The old obligation to register the C. of new works at Stationers' Hall was also modified; registration is no longer obligatory, but the practice of registering is still requisite for the sake of evidence in making good claims of copyright. Forms of registration and assignment are given by the act, but the use of them is not indispensable. The law of C. makes no distinction between British subjects and aliens. A foreigner may own the C. of a work printed first in Great Britain; but neither he nor any other person could maintain a claim of C. in a work which had been previously issued in a foreign country with which there is no international treaty of copyright. Attempts are sometimes made to evade this, by issuing editions of a work simultaneously in the United States and England on the same day, so as to secure both British and American copyrights.

The ordinary process of stopping the issue of unauthorised reprints of C. works, which receive the name of pirated editions, consists, in the first place, in procuring an injunction from the Court of Chancery (if in Scotland, an interdict from the Court of Session), and of afterwards raising an action of damages at common law. On all that concerns prosecution, as well as for many details respecting C. in its different varieties, we refer to Godson and Burke's *Treatise on the Law of Copyright.*

Such is the history and general nature of the law of C. respecting books. The last-mentioned act, more explicit than previous statutes, remains the great charter on the subject. Unfortunately, it still leaves some defects which it would require a fresh law to remedy. The extension of C. for the assumed benefit of authors and their families, which is the leading feature of the act, must be pronounced generally worthless. In the great majority of cases, authors assign the C. of their manuscripts for a consideration to publishers, who, looking for remuneration within a reasonable length of time, cannot, and as a rule do not, give a higher price for a 42 than for a 28 years' copyright. The tendency of Talfourd's act is still more than ever to lock up copyrights in the hands of the original assigns, where they are apt to become torpid and useless. A remedy for this evil has lately been found in a practice followed by certain acute and enterprising publishers of cheap reprints. Buying up the unexpired copyrights of books which have gone somewhat out of notice, they issue them in a form suitable to the nature of their business; and such reanimated productions constitute no small share of the cheap volumes that invite public attention—the author and his heirs being not in the slightest degree benefited by the process of literary resurrection.

*Extracts, Abridgments, &c.*—C. in a book entitles the proprietor to prevent extracts being made from it; but in practice, short extracts for the purpose of criticism, as in reviews, or for historical illustration, are tolerated. Unauthorised abridgments of C. works are deemed piracies, and their sale can be stopped. In such cases, however, the abridgment must shew a clear adoption of the language or collocation of words of the original. It is now determined that no C. can be maintained in mere subject, information, or ideas. A writer may have put himself to great trouble to procure information on a particular subject; but the law does not recognise how information is procured. If a second writer use the information of the first (though that may have little regard to matters of fact), and make out of it a new work, there is no invasion of C. unless the words of the first have been at the same time taken. See Preface to Napier's *Memoirs of Dundee.*

*Encyclopædias, Periodicals, &c.*—The C. of articles contributed for and included in encyclopædias, magazines, reviews, or other periodical works, and of books published in a series, was regulated by the Act 5 and 6 Vict. c. 45. The C. of such articles, being paid for and assigned, belongs to the publisher, but he cannot publish them separately without the consent of the author. The author, however, may reserve the right of separate publication, and merely sell the right to use the article; but, should he republish any such article or articles, it may only be done in such a manner as not to prejudice the right of the original publisher.

*Dramatic Pieces and Musical Compositions.*—These with right of representation and performance are, by the Act 5 and 6 Vict. c. 45, subject to the same C. as books. Strictly, a C. song cannot be publicly sung, or a tune publicly played, without the permission of the composer or his assigns. Verses must not be taken from a periodical or copyright work, and set to music, for sale, without permission. A C. work of fiction may be dramatised without the consent of the proprietor, who has no statutory power to forbid the performance.

*Lectures and Public Addresses* remain the C. of the person delivering them. By 5 and 6 William IV. c. 65, printers and publishers are liable to a penalty for printing and issuing spoken addresses without the consent of the author. It is understood that no one is at liberty to take down a sermon as delivered by a clergyman, and publish it without permission; the act, however (§ 5), makes some exceptions: protection is not extended 'to any lecture or lectures delivered in any university, or public school, or college, or in any public foundation, or by any individual in virtue of, or according to, any gift, endowment, or foundation.' Under this permissive clause, it would appear that sermons delivered by clergymen of the Established churches, in endowed places of public worship, are deemed public property.

*Letters*, and every kind of epistolary correspondence, are the property of the writer. The receiver of a letter may retain it for his own use, but, strictly, he cannot publish it without the permission of the sender or his heirs, neither can he sell it as a curiosity. The sale of letters of distinguished individuals is illegal, though ordinarily tolerated. See *Curtis* on the law of C., pp. 87, 89, et seq., and cases there quoted. As to the rule in this respect in Scotland, see the proceedings in the case of the *Scotch Thistle* newspaper, in Irvine's report of the trial of Madeleine Smith, pp. 93 and 305.

*Newspaper matter* is subject to the common law of C., but practically, and for mutual convenience, the intelligence in one paper is freely copied by the more respectable class of papers with, and in the less respectable without, acknowledgment. The taking of leading articles in the same manner might doubtless be checked; as would also be the unauthorised adoption of existing newspaper titles.

*Engravings, Maps, Charts.*—C. in these is secured by several acts, more particularly the 17 Geo. III. c. 57. The term of C. is 28 years. Each engraving or map must have on it the date of publication and name of publisher. Those who infringe C., forfeit the plates on which the pirated engravings or maps were printed; they forfeit also every pirated sheet, and five shillings for every print undisposed of. There is no C. in subject. Any one may invent or delineate and sell pictures from subjects in C. books, without challenge. It is understood that in painting a portrait, C. remains with the artist, although he be paid for the picture, and the purchaser cannot take copies without permission or assignment. C. as to paintings, however, is ill defined and defective, and an improved law on the subject is said to be under consideration. See Design, under which head is also noticed the C. of models, sculptures, casts, patterns of carpets and paper-hangings, &c.

*Copyright in the Colonies.*—By the Act 5 and 6 Vict. c. 45, the C. of books, &c., printed in the United Kingdom, is extended to all British colonies; and the Act 8 and 9 Vict. c. 93, concerning the trade of the colonies, absolutely prohibited these dependencies from importing pirated editions of C. works. Practically, this last recited act was unavailing. Large quantities of cheap reprints of British C. books continued to be imported from the United States into the British American possessions. Remonstrances against these irregularities at length led to some special legislation. It was ordained by the Act 10 and 11 Vict. c. 95, that the colonies might respectively enact a law to enable them to import pirated C. works, on the plan of exacting a custom-house duty on such works, the proceeds to be handed to the proprietors of the said copyrights. Colonial laws were accordingly enacted. The understood arrangement is, that English publishers shall furnish catalogues of their copyrights to the custom-house authorities in the different colonies, as a guide for exacting the protective duties (amounting in Canada to 12½ per cent. ad valorem). These measures are next to inoperative, and the whole thing is little better than a delusion. So little is collected, that publishers generally have ceased to give themselves any concern in the matter. In short, unauthorised cheap reprints of British C. works may be said to be freely imported into and sold in the colonies; this kind of trade in itself tending to indispose the United States to enter into an international law of C. with the United Kingdom. Latterly, pirated reprints of British C. works have begun to be produced in Canada.

*Copyright in the United States* is well defined. The latest act of congress on the subject is that of February 3, 1831. C. can be secured by any citizen of the United States or resident therein, who is the author of any book, map, chart, or musical composition. The term of C. is 28 years from date of recording; but at the end of that term, the author if living, or, if dead, his widow or child, may record C. for an additional term of 14 years. In cases of renewal, record to be published in one or more newspapers. The first step in securing C. is to record the claim, according to a certain form in the book of the clerk of the district kept for that purpose; at the same time lodging a copy of the work. Within three months thereafter, a copy to be sent to the librarian of the Smithsonian Institution, and another copy to the librarian of Congress Library. It is requisite that notice of entry of C. be printed on the title-page, or page immediately following. All pirated copies of C. works are to be forfeited, independently of claims for damages by action at law. The C. recorded in any state extends to all the states in the Union.—See Bouvier's *Law Dictionary of the United States* (Philadelphia, 1860).

*Copyright in Germany* has been regulated as respects duration by the Confederation; a resolution of which, in 1837, fixed the duration of literary property at 10 years, and another resolution in 1845, extended it to the lifetime of the writer and for 30 years after his death. The laws regulating the contract of an author with his publisher vary in the different states. In Prussia, when an author assigns a C. to a publisher without any special stipulation, the publisher is entitled to issue only one edition, the extent of which he may determine. This principle is adopted both in Saxony and Bavaria, the edition in the latter country, in the absence of stipulation, being limited to 1000 copies. But a distinction is made in Prussia between reprints or new issues (*auflagen*) and new editions (*ausgaben*). In the case of the former, the publisher is left free, on condition that he shall pay to the author, on the occasion of each new issue, half the sum which he paid him for the first. New editions, on the contrary, can be published only with permission of the author, which must be given in writing. This privilege is limited to the author's life, though his children have a claim for a *honorarium* for each edition issued after his death. In Gotha, the law of 1828 grants to the publisher an unlimited power of issuing new reprints, but in Bavaria, the permission of the author is required even for this purpose. The rights of the publisher may be transferred, and those of the author descend to his heirs. When the rights which have been conveyed to the publisher terminate, the author becomes again the unlimited proprietor of the work.

*Copyright in France* exists in the author and in his widow for life, in his children for twenty years, and in his other heirs or assignees for ten years after his own death or that of his widow. In *Belgium* the same law prevails, with this exception, that the right, whether in children or in other representatives, extends to twenty years after death.

*International Copyright* is a mutual arrangement between two countries to protect each other's copyright, translations included. The United Kingdom has now an arrangement of this nature with Hamburg, Belgium, Saxony, Prussia, France, and Sardinia (Italy). The United States have ever refused to enter into any international law of C. with Great Britain; a circumstance, as is understood, imputable chiefly to the opposition of the leading publishers of pirated editions of British C. works.

The late Right Hon. James Wilson contemplated a consolidation of the C. laws, and such a measure is certainly very desirable. Amongst improvements required may be cited the following: 1. An improved system of registration. As matters are now conducted at the Stationers' Hall, any person may make any entry he pleases, with very little check in case of false pretension. A reform in this particular should embrace a system of registration in Edinburgh, and also in Dublin, as well as in London, for the convenience of the three sections of the United Kingdom; the registrar of each section to get copies annually of the other registers for general inspection. 2. A clearer understanding of the posture of articles contributed to periodicals, encyclopædias, &c. It would probably answer the main purposes of justice, if the proprietor of the work contributed to were held as having, by his stipulated payment, acquired the C., unless where a special reservation was made. 3. A protection to publishers for literary services paid under a salary. It is clearly absurd to expect that each particular article, or, say, addition to a formerly existing book, written in these circumstances, should be matter of formal assignment; and in practice no such assignment takes place. Yet, with authors disposed to take advantages, there may be cases in which the honourable understanding as to the sufficiency of salary may be no protection to the publisher from at least a harassing litigation. 4. A remedy for the great mistake made in Talfourd's act, in the extension of copyright. By making this extension only to the representatives of authors who had not parted with their copyrights, the real objects of the act would be secured, and an additional inducement to prudence on the part of literary men would be established. See BOOK-TRADE. W. C.

**COQUEREL**, ATHANASE LAURENT CHARLES, a minister of the Reformed Church in Paris, and one of the most celebrated pulpit orators of France. He was born in Paris in 1795, and studied theology at Montauban. Afterwards, he became minister of the French church in Amsterdam, where he remained twelve years. In 1830, Cuvier induced him to return to Paris, where he continues to hold the office of a preacher of the gospel. In 1848, he was elected a delegate to the National Assembly by the department of the Seine, but he did not appear to much advantage either in this Assembly or in the Legislative Assembly, of which he was also a member. He has written many works on religious subjects, history, and literature, all of which are marked by an earnest and liberal spirit. By the more rigidly orthodox of his co-religionists, C. is regarded as a heretic—a kind of Christian rationalist, but their hostility has not hindered his popularity from increasing steadily year by year.

**COQUI'LLA NUT**, the fruit of a palm, *Attalea funifera*. See ATTALEA. It now forms an article of export from South America, being used to a considerable extent in Britain in the manufacture of buttons and in turnery, as for making knobs of walking-sticks, umbrella handles, handles of bell-pulls, &c. It is very hard, susceptible of a good polish, and beautifully mottled with dark and light-brown. The demand for coquilla nuts seems likely to increase; and probably the fruits of some other palms may be found suitable for similar purposes.

**COQUI'MBO**, the name of a river, department, and city of Chili.—1. The river, rising in the Andes, enters the Pacific about lat. 29° 55′ S., and long. 71° 25′ W., and forms, at its mouth, one of the best harbours in the republic.—2. The department, extending in lat. from 25° 30′ to 31° S., and in long. from 69° to 72° W., occupies the entire breadth of the country between Aconcagua on the south and Atacama on the north. With the exception of the immediate banks of streams, it is parched and barren, being valuable chiefly for its mines of silver and copper. Physically, the region here and there presents galleries of shingle-terraces with organic remains. See CHILI. The population in 1855 was 110,689.—3. The city stands at the entrance of the river, and contains about 6000 inhabitants. In addition to copper and silver, it largely exports chinchilla skins. The number of vessels entering and clearing in 1855 was 237, with an aggregate burden of 102,268 tons.

**COR ANGLOIS**, a wind-instrument of the reed species, the body of which is bent in the form of part of a circle. It is just a large oboe, and played on by oboe-players. Its compass is from F, fourth line in the bass, to B flat above the treble staff. Music for this instrument is written a fifth above the real tones.

**COR CA'ROLI.** See CONSTELLATION.

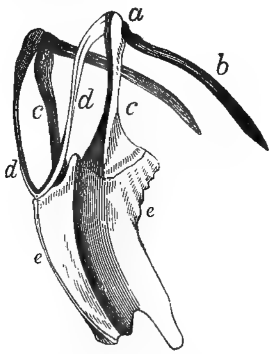
**CO'RA, CO'RÉ**, or **CO'RI**, a town of South Italy, 30 miles south-east of Rome. It is most picturesquely situated on a commanding elevation in the midst of olive-plantations, and crowned by the ruins of ancient temples. Two torrents dashing through deep ravines on the east and west side of the hill add romance to the situation. The town, divided into an upper and lower part by an olive-grove, is surrounded by walls, chiefly of 15th c. date, and is on the whole well built, clean, and healthy, with a population of 4000. C. preserves the name, and occupies the site, of one of the oldest cities in Italy. Virgil and Diodorus make it an Alban colony, while Pliny ascribes to it a Pelasgic origin. In any case, it was early one of the most important cities of Latium. The ancient remains still existing—including those of the old walls, a Doric temple called the *Temple of Hercules*, a Corinthian temple, consecrated to Castor and Pollux, and a fine bridge—are among the most interesting in Italy.

**CORA'CIAS.** See ROLLER.

**CO'RACLE.** See CURRACHS.

**CO'RACOID BONES.** In the mammalian skeleton, the scapula or blade-bone presents a projecting bony process termed the Coracoid Process, from its supposed resemblance to a crow's beak (Lat. *kŏrax*, a crow); and from the idea that the bones which we are now describing, and which exist in all birds, in saurian and chelonian reptiles, and in the monotremata, correspond anatomically with the comparatively slightly developed coracoid process, they have received the name which is now universally assigned to them.

As the uses of these bones are most obvious in birds, we shall confine our remarks to this class of animals. It is obviously necessary that the scapular arch should be very strong in birds, in order to form a solid resisting fulcrum to the powerful movements of the humerus and other wing-bones. The scapula (see *b* in the fig.) is a long, curved, compressed bone, extending along the back on each side of the dorsal vertebræ, imbedded in the muscles to which it gives attachment, while at its fixed extremity it assists in forming the cavity of the shoulder-joint (*a*). The coracoid bone (*c* in fig.) is the great support of the shoulder; for while at one extremity it sustains the wing, at the other it is firmly secured to the sternum by a broad and strong articulation; indeed, it forms the main resistance to the approximation of the humerus to the median plane, and retains it firmly in its lateral position. The scapula and coracoid bone are anchylosed (or united by osseous matter) at their point of union, thus forming collectively the structure popularly known as the side-bone. The clavicles, *d, d,* which are conjoined to form the furcula, combine to add to the stability of the whole apparatus.

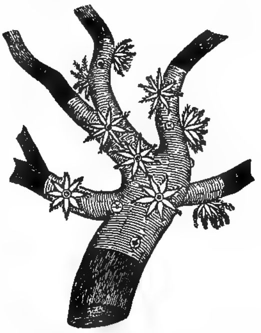


Sternum of Barn Owl:

*a*, the glenoid or shoulder-joint cavity; *b*, the scapula; *c*, *c*, the coracoid bones, articulating at one end with the sternum or breast-bone *e*, and at the other with the scapula *b*, with the clavicle *d*, and with the humerus or great bone of the wing. The union of the two clavicles, *d*, *d*, to form the furcula or merry-thought bone, is well shewn in this figure.

**CORA'ÏS,** ADAMANTIOS, called by the French CORAY, one of the most learned Hellenists of modern times, and a great benefactor of his nation, was born at Smyrna on 27th April 1748. His father was a merchant, and he for some time also engaged in mercantile pursuits; but having from his earliest youth delighted in the study of ancient and modern languages, he relinquished business, and devoted himself to literature. He fixed his residence in Paris, and there continued to reside till his death on 6th April 1833. He published editions of many ancient Greek authors, adding notes and prolegomena, in which his patriotic zeal was often very strongly displayed. He translated into modern Greek the work of Beccaria, *Dei Delitti e delle Pene;* and by various translations and other publications, exercised a great influence in awakening the minds of his countrymen. When the Grecian war of independence began, C. was too aged to take any active part in it, but by his writings he shewed his sympathy with the cause of his country.

**CO'RAL,** a calcareous secretion or deposit of many kinds of Zoophytes (q. v.) of the class *Anthozoa*, which assumes very various, and often beautiful forms, according to the different laws which govern the gemmation of the polypes of the different species. The C.-producing zoophytes are compound animals, which increase by gemmation, young polype buds springing from the original polype, sometimes indifferently from any part of its surface, sometimes only from its upper circumference, or from its base, and not separating from it, but remaining in the same spot, even when the original or parent polype has ceased to exist, and producing buds in their turn. The calcareous deposition begins when the zoophyte is still a simple polype—owing its existence to oviparous reproduction—adhering to a rock or other substance, to which the calcareous matter becomes affixed, and on which the C. grows or is built up, the hard deposits of former generations forming the base to which those of their progeny are attached. One layer of the calcareous polype cells of which the greater number of corals are composed, occasionally surrounds another like the concentric circles in the wood of exogenous trees; one layer is sometimes deposited above another; the whole structure sometimes branches like a shrub, spreads like a fan, or assumes the form of a cup, a flower, or a mushroom. Under the common name C. are included many species, also designated Madrepores (q. v.), and some have received other names derived from peculiarities of their form and appearance, as Brainstone C. (q. v.), &c. In the greater number of kinds, besides the calcareous plates which form and separate the polype cells, and which are variously arranged according to the form and structure of the polypes themselves, there is a more solid internal or central calcareous part, formed by the additional deposition of calcareous matter at the bottom of each polype cell, or from the common living part in which the polypes are united. The calcareous framework is further strengthened by a greater or less mixture of horny animal matter with the pure calcareous substance. This calcareous framework is analogous to the cartilaginous, leathery, or fibrous framework of many other compound zoophytes, as *Alcyonium* (q. v.), or *Dead Man's Fingers.* The polypes of the common RED C. (*Corallium rubrum*) indeed very much resemble those of *Alcyonium;* but the central axis in this and other corals forming the family *Corallidæ* is quite solid, being produced in concentric layers by the living gelatinous substance, which envelopes it like the bark of a tree, and from which the polypes project like buds, or, when their tentacula are expanded, like little flowers. In the *Madreporidæ,*



Coral, shewing the Polypes (*Corallium rubrum*).

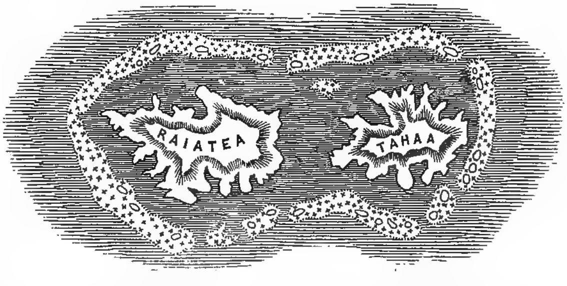
the general structure more nearly resembles that of *Alcyonium*. Many of them, however, have the whole calcareous framework covered as in the *Corallidæ*, by a gelatinous living substance which unites all the polypes. The whole living part soon decomposes and disappears, when the C. is taken out of the water; in some species, almost immediately running from the calcareous part as a watery slime.

Corals chiefly abound in the seas of the warmer latitudes, where they form extensive banks at no very great depth, and their various and bright colours present the appearance of submarine flower-gardens. Numerous species are usually combined in the formation of a single C. reef, and respectively occupy different places in it. Corals of the branching genus *Porites* usually occupy the exposed edge of the reef, and with them is associated *Millepora complanata*, a species which forms thick vertical plates, united at different angles by their edges, the outer plates only being tenanted by living polypes. In the stiller water within are many more delicate kinds, and in the quiet sheltered depths, brainstone corals and flower-like forms appear.

The C. of commerce, or common **Red C.**—so much admired for its fine colour, susceptible of a high polish, and much used for ornamental purposes—is chiefly obtained from the Mediterranean, in some parts of which extensive 'coral fisheries' are carried on. It is brought up from considerable depths by means of a sort of grappling apparatus dragged after a boat or boats; the pieces being broken from the bottom by beams of wood which are sunk by weights, and then entangled among hemp. Red C. has a shrub-like branching form, and grows to the height of about one foot, with a thickness like that of the little-finger. Much of the C. of the Mediterranean is exported to India, but Red C. is also obtained in the Red Sea, the Persian Gulf, &c.—**Black C.** (*Antipathes*), the axis of which is rendered still more solid by the greater mixture of horny with calcareous matter, is still more highly prized.—C. was known to the ancients, and was used for ornamental purposes by the Gauls.

**CORAL FLOWER**, or **CORAL TREE** (*Erythrina*), a genus of trees and shrubs, of the natural order *Leguminosæ*, sub-order *Papilionaceæ;* of which the species, natives of tropical and sub-tropical regions, generally produce long spikes of beautiful flowers of a rich dull crimson or a scarlet colour, resembling coral. The leaves have three leaflets. The *standard* of the flower is remarkably long. The C. F. of Brazil (*E. crista galli*) is common in British green-houses. The Indian C. F. (*E. Indica*) is used in the East Indies for hedges, its stem being covered with thorns. The wood is so light and spongy that it is used for the largest sizes of corks.—*Jatropha multifida*, a very different plant, of the natural order *Euphorbiaceæ*, has also acquired the name of Coral Tree.

**CORAL ISLANDS** exist most abundantly in the tropical and sub-tropical parts of the Pacific Ocean. The formation of coral goes on, in favourable circumstances, with wonderful rapidity, for masses of coral have been found to increase in height several feet in a few months; and a channel cut in the reef surrounding a coral island, to permit the passage of a schooner, has been choked up with coral in ten years. It was at one time supposed that the coral polypes began their labours at the bottom of the ocean, and reared their pile from its greatest depths; but it has been ascertained that none of them live at depths of more than twenty or thirty fathoms, and most of them are inhabitants of much shallower water. It appears, therefore, that the foundation of their still marvellous structures must be on rocks that do not reach the surface, probably in most cases volcanic rocks similar to those which, being further upheaved, form the volcanic and often mountainous islands of Polynesia. Around these volcanic islands, which—although some of them are the largest islands of the Pacific Ocean—are far fewer in number than its C. I., a fringing reef of coral is often found immediately attached to the land; whilst in many other cases, the reef surrounds the island, the intervening space—of irregular, but nowhere of great width—forming a lagoon or channel of still water, protected by the reef from winds and waves. According to a theory proposed by Mr Darwin, and now very generally accepted, this latter kind of reef is formed from a reef of the former or merely fringing kind, by the gradual subsidence of the rocky basis carrying down the fringe of coral to a greater depth; whilst the greatest activity of life is displayed by polypes of the kinds most productive of large masses of coral in the outer parts which are most exposed to the waves. In this manner also he accounts for the formation of true C. I., or *atolls*, which consist merely of a narrow reef of coral surrounding a central lagoon; and very often of a narrow reef—perhaps half a mile in breadth—clothed with luxuriant vegetation, bordered by a narrow beach of snowy whiteness, and forming an arc, the convexity of which is towards the prevailing wind, whilst a straight line of reef not generally rising above the reach of the tide, forms the chord of the arc. There is generally a navigable passage through the reef into the enclosed lagoon, the waters of which are still and beautifully transparent, and the depth of water close to the precipitous sides of the reef is almost always very great. The passages through the reefs surrounding the larger volcanic islands are often opposite to the mouths of streams; but even where this is not the case, there is a strong current in these channels from the flux and reflux of the tides. Islets bearing a few cocoa-nut trees often appear at intervals in the line of a low coral reef, and very generally mark the sides of passages through it. When a reef has reached the surface of the water, sand, shells, fragments of coral, and other substances, begin to accumulate, and cocoa-nut trees often grow where the waves still wash their roots. Further accumulations from the ocean, with decayed leaves, stems, &c., gradually convert the reef into fertile land. Many C. I., of considerable extent and population, are nowhere more than a few feet above the level of the sea. Sometimes a volcanic upheaval seems to have taken place after the coral was formed, and this is supposed to have been the origin of the islands—



comparatively few in number—called *Crystal Islands*, composed of coral rock, more or less modified by the action of air, water, and other agents. Islands of this class sometimes rise to an elevation of 500 feet, and often exhibit precipitous cliffs, and contain extensive caverns. They do not exhibit, however, the picturesque beauty of the volcanic islands, nor the soft and gentle loveliness which often characterises the true C. I., and which has received the enthusiastic praise of all voyagers in the south seas.

Coral reefs sometimes include within their circuit more islands than one. The preceding cut shews the reef surrounding the islands of Raiatea and Tahaa (Society Islands). Reefs also sometimes extend to a great length in a straight line, generally parallel to a coast, the submergence of which they are supposed to indicate. There is such a reef on the east coast of New Holland, extending not less than 350 miles, without being broken by a channel.

**CORAL RAG**, a group of the Oxford or Middle Oolite (q. v.), consisting of continuous beds of petrified corals of very variable thickness, interstratified with beds of oolitic limestone. These strata occur in the northern districts of Berkshire and Wilts, and again, with the same characteristics, in Yorkshire, while in the intermediate district the whole group seems to disappear. It attains to a maximum thickness of 190 feet. The corals retain the position in which they grew at the bottom of the sea; they sometimes form masses 15 feet thick. The characteristic genera are *Isastræa* (q. v.), *Thamnastræa* (q. v.), and *Thecosmilia* (q. v.). With them are associated the remains of mollusca and echinodermata.

**CORAL SEA**, so called from the substance of its numerous reefs, is that section of the Pacific which stretches between Australia on the west and the New Hebrides on the east. Its general depth must be very considerable, for soundings of 2150 fathoms, or nearly 2½ miles, have been obtained in lat. 13° S., and long. 162° E.

**CO'RALLINE** (*Corallina* and *Corallinaceæ*), a genus and family of marine *Algæ*, of the sub-order *Ceramiaceæ*, remarkable for rigidity, which is mostly owing to a calcareous incrustation. When the calcareous matter is removed by a weak acid, the resemblance to other *Ceramiaceæ* becomes very apparent. The Common C. (*C. officinalis*), extremely abundant on the British coasts, at first appears as a thin, round, shelly, purplish patch, on a smooth rock, the shell of a mollusc, or the frond of a seaweed, gradually enlarges, and usually sends up a frond of jointed branching filaments, in a bushy tuft, an object of great beauty in the rock-pools. Although, as its name imports, this C. was once *officinal*, it has no medicinal virtues. Some of the corallines expand into leafy lobes, usually fan-shaped. Corallines are most abundant in tropical seas, and there display their greatest beauty.

The name C. is often popularly given to zoophytes of the class *Anthozoa*, and genera *Sertularia*, *Thuiarea*, *Antennularia*, *Plumularia*, *Laomedea*, *Campanularia*, &c., having branching polypidoms and hydraform polypes, of which the British coasts produce many small but extremely beautiful species.

**CO'RANACH, CORANICH, CRONACH**, &c., a funeral dirge, formerly in use among the Irish and Scottish Celts. The word is probably derived from the Gaelic *cornh-rànaich*, a crying together. 'The cries (coranich) are called by the Irish the Ulagohne and Hululu, two words extremely expressive of the sound uttered on these occasions (funerals); and being of Celtic stock, etymologists would swear to be the origin of the *ololugon* of the Greeks, and *ululatus* of the Latins.'—Pennant's *Tour*.

The C. seems to be identical with the Irish *caóine*, generally written and pronounced *keen*, a dirge for the dead, 'according to certain loud and mournful notes and verses,' wherein the pedigree, property, the good and great deeds of the deceased, and the manner of his death are recounted, in order to excite sorrow or revenge in the hearers, and to shew them the loss they have sustained.

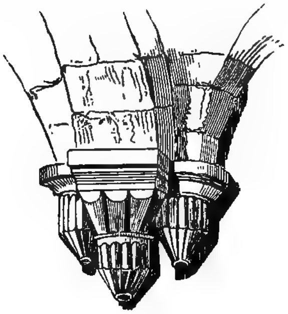
The word, in one or other of its forms, occurs in the writings of many of the ancient Scottish authors:

> 'Cryand for you the cairfull corrinoch.'
> *Sir D. Lindsay.*
>
> 'Cryand the corynoch on hie.'
> *Battle of Harlaw.*
>
> 'Be he the correnoch had done shout.'
> *Dunbar.*

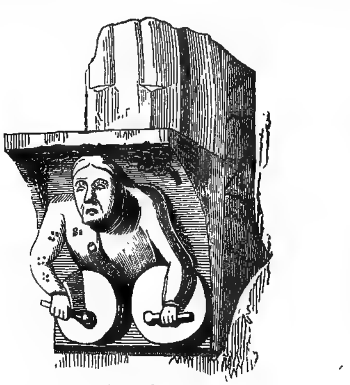
The C. has long since fallen into disuse among the Highlanders. The funeral lament performed on the bagpipes, which may be considered as an instrumental C., lingered on till the latter half of the 18th century.

For specimens of the C., see Sir Walter Scott's *Lady of the Lake*, and accompanying notes; Crofton Croker's *Researches in the South of Ireland;* and *Blackwood's Magazine*, vols. xiii. and xxiii.

**CO'RBEL** (Fr. *corbeille*, a basket). In architecture, this term, adhering originally to its etymological meaning, signified an ornament in the form of a basket, like those sometimes set on the heads of caryatides. In Gothic architecture, to which it is



Corbel:
Kirkstall Abbey.

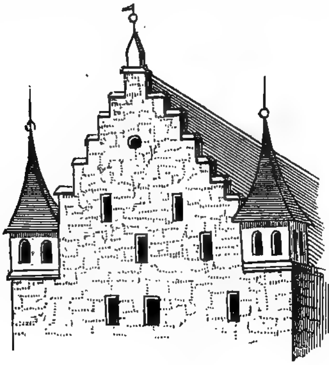


Corbel:
Duston, Northamptonshire.

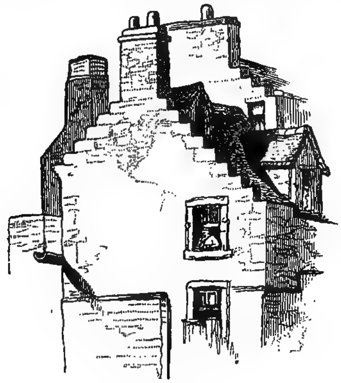
now almost peculiar, it is applied to any kind of ornamented projection used for supporting pillars or other superincumbent weights. Here also its form probably was at first that of a basket projecting from the wall, in which the end of the pillar was placed, and on which it rested. Latterly, the more ordinary form was that of a head, with the face looking outwards or downwards. In this form it is found in all the styles. A recumbent animal, again, is sometimes placed under the pillar, and there are a great variety of other forms. When any construction is carried out, so as to rest on corbels, and to project beyond the face of a wall, it is said to be *corbelled out.* See BRACKET, CANTALIVER, CONSOLE.

**CO'RBIE**, a heraldic term for a raven. See CORBIE-STEPS.

**CO'RBIE-STEPS**, or **CROW'-STEPS** (Fr. *corbeau*, Lat. *corvus*, a crow). The word corbie or corby, though obsolete in English, except as a heraldic term, has retained its place in the Scottish dialect, and in architecture C. signify the succession of steps with which the gables of old houses are everywhere ornamented in Scotland. The fashion, like most of the other peculiarities of Scottish architecture, was no doubt borrowed, as was the term, from France. In the domestic buildings of Edinburgh, it is found in the highest degree of prevalence between 1620 and 1640. The notion, of course, was that the steps were for the use of the crows. This gable ornament is by no means peculiar to France, but is met with in Flanders, Holland, and all over Germany. Parker, in his *Glossary*, gives an illustration from Cologne; and the accompanying illustration, No. 1, represents the gable of a house in Nuremberg, which it will interest the student of Scottish domestic architecture to compare with the illustration No. 2, which is taken from a house in the Castle Wynd of Edinburgh.



No. 1.



No. 2.

**CO'RCHORUS**, a genus of plants of the natural order *Tiliaceæ*, having five sepals, five petals, numerous stamens, and a capsule; and containing a number of species, both shrubby and herbaceous, natives of the warm parts of the globe. *C. olitorius* is widely diffused in tropical countries, and is supposed to be a native of Asia, Africa, and America. It is an annual, with a smooth, more or less branching stem; varying in height from two to fourteen feet or upwards, according to soil and climate. It has smooth, stalked, alternate, oval, or ovato-lanceolate leaves, and small yellow flowers, solitary or in pairs on foot-stalks. It is much used as a pot-herb, and is called JEWS' MALLOW, from being much cultivated by Jews in Syria and other parts of the East. It is still more valuable for the fibre of its inner bark, as is also *C. capsularis*, a species very similar, but distinguished by the want of transverse partitions in its capsule. Both are much cultivated in India, yielding the greater part of the JUTE (q. v.) of commerce, and of the fibre employed in making *Gunny Bags* (q. v.). *C. capsularis* being extensively cultivated in China, is sometimes called CHINESE HEMP.

The Japanese shrub, now very common in Britain, and still very generally known as *C. Japonicus*, was ranked in this genus when botanists were very imperfectly acquainted with it, but belongs to the genus *Kerria*, of the natural order *Rosaceæ.*

**CO'RDAGE**, a seaman's name for the running rigging of a ship, as distinguished from the standing rigging. The name is also given to the store of rope kept in reserve. See RIGGING, ROPE.

**CORDAY D'ARMANS**, MARIE ANNE CHARLOTTE, known as CHARLOTTE CORDAY, was born at St Saturnin, in the department of Orne, in 1768. Though descended from a noble family, she early imbibed revolutionary principles, but was horrified at the monstrosities of the Jacobins; and her hatred of their acts was intensified by converse with a party of proscribed Girondists, who had fled to Normandy. She resolved to rid her country of one of the principals of the Jacobin faction, and with that view travelled to Paris. Whether to slay Robespierre or Marat, was an open question with her; but while she was debating the matter with herself, a demand of the latter for a hundred or two hundred thousand more victims for the guillotine, marked him out for her weapon. Twice she sought admission to Marat unsuccessfully, but on a third occasion (July 13, 1793), was admitted on the plea that she had important news from Caen to communicate. She found Marat in his bath, who, to some statement she made, declared that the Girondists who had fled to Normandy, some of whom were her own friends, would be guillotined in a few days. She no longer hesitated, but plunged her dagger into the monster's heart, who expired with a single groan. She was at once arrested, and brought before the Revolutionary Tribunal, where she boldly avowed and justified her act. She was of course condemned to the guillotine, and the sentence was carried into effect on the 17th July 1793. Her beauty added greatly to the interest which her sanguinary heroism inspired.

**CORDELIERS** ('cord-wearers') was the name applied, in France, to the strictest branch of the Franciscan friars, on account of their wearing a girdle of knotted cord. At one period, this order had no less than 284 male and 123 female convents. During the Revolution, the name was applied to the members of a political club which assembled in the chapel of a Franciscan monastery, and exercised (chiefly in Paris, however) great influence on the progress of the revolution. It was instituted in 1790. Its leaders were men of various opinions, including Danton, Hébert, Camille Desmoulins, and Marat. The C. were generally opposed to the Jacobins (q. v.); but it may be asserted that in these two clubs all the great popular movements of the revolution had their origin. In the session of the C., May 22, 1793, the insurrection which marked the close of the Reign of Terror was plotted. While the club was at the height of its influence, Camille Desmoulins commenced to issue his popular journal, *Le Vieux Cordelier*. Soon after the fall of Danton, the C. club lost its influence, and was an insignificant affair when it was closed by the Convention.

**CO'RD-GRASS** (*Spartina*), a genus of grasses having compound spikes, the spikelets arranged on one side; and having only one perfect floret, and very unequal glumes. One species, *S. stricta*, found in muddy salt-marshes on the east and south-east coasts of England, although remarkable for its extreme stiffness and rigidity of habit, is used for making ropes, on account of the toughness of its fibre.

**CORDIA'CEÆ**, a natural order of exogenous plants, closely allied to *Boragineæ*, from which it differs chiefly in its drupaceous 4—8-celled fruit. It consists of trees with rough leaves, chiefly natives of the tropics, although some are found in cool parts of South America. The fruits called Sebesten (q. v.), or Sebesten Plum, belong to this order, and to the genus *Cordia;* which also contains some valuable timber-trees, particularly the Spanish Elm, Prince Wood, or *Bois de Chypre* of the West Indies (*C. Gerasacanthus*). It is a dark-brown wood, faintly striped, tough, elastic, and fine grained.

**CORDI'LLERAS OF CENTRAL AMERICA.** The word *Cordillera* literally signifies a chain, and is applied in Spanish America to a chain of mountains. The C. of South America are described under Andes. Those of Central America extend from the commencement of the Isthmus of Darien to the north of Mexico and California, and spread themselves, to speak generally, from sea to sea, presenting many diversities, and occupying the states of New Granada, Costa Rica, Nicaragua, Honduras, San Salvador, Guatemala, the Mexican Confederation, and New Mexico. They gradually increase in elevation from the Isthmus of Panama, where at one point they are only 260 feet high, until, in Mexico, they reach a height of more than 17,000 feet, and form magnificent plateaux.

**CO'RDON**, in military operations, is a line of sentries enclosing or guarding any particular space of ground, to prevent the passage of persons other than those belonging to the army. The sentries are placed within sight of each other. If intended to guard against contagious diseases, it is called a *C. Sanitaire.*

**CO'RDOVA**, or **CO'RDOBA**, a city of Spain, capital of the province of Cordova, is situated in the midst of olives and palm-trees on the Guadalquiver, here crossed by a stone bridge of 16 arches, constructed by the Moors. Lat. 37° 52′ N., long. 4° 49′ W. Its old Moorish walls and convent-crowned hill in the background give it quite an Oriental aspect; but its beauty, like most Oriental beauty, is merely external; inside, its streets are narrow, dark, and dirty, with a general appearance of decay. Many gardens are enclosed within the walls. Among the principal buildings is the cathedral, formerly a Mohammedan mosque, an immense structure dating from the 8th c., and generally regarded as the finest type of a Moslem temple in Europe. Internally, its columns, composed of various coloured marble, jasper, and porphyry, form a perfect grove, there being still some 850 remaining, though at one time there were about half as many more. The bishop's palace, an old residence of the Moorish kings now used as stables, and several of the churches and convents, are also noteworthy. C. was at one time celebrated for its manufacture of Cordovan (q. v.), but that has now greatly declined. Its silversmiths and filigree workers have still a good reputation; and there are manufactures of paper, silken fabrics, hats, &c. Its inhabitants are proud, above even the pride of Spaniards. Pop. 55,000. C. is a very ancient place, having been founded by the Romans as Corduba, 152 B. C. Cæsar, 45 B. C., put 22,000 of its inhabitants to death for having sided with Pompey. Taken by the Goths in the 6th c., it soon after fell into the hands of the Moors, and became the capital of the Moorish empire in Spain. From the 9th c. to the 12th c., it was one of the greatest centres of commerce in the world, and is said to have contained a million inhabitants. It was taken by Ferdinand III. of Castile in 1236, and never afterwards regained its prosperity. In modern times, C. was taken and plundered by the French under Dupont in 1808. C. is the birthplace of the two Senecas, the poet Lucan, and the astronomer Averroes. The province of Cordova has an area of 4159 square miles, and a population of 362,538. See ANDALUSIA.

**CORDOVA**, the capital of a state of the same name in the Argentine Confederation (q. v.), is situated on the Rio Primero, a tributary of the Parana, in lat. 31° 26′ S., and long. 63° 55′ W. It was founded by the conquerors of Tucuman in 1573. It has a cathedral and several churches, with a population of 25,000. The state, of which C. is capital, is situated near the centre of the Confederation, and contains about 57,275 square miles, with a population, in 1855, of 130,000, who occupy chiefly its western section. Cattle, sheep, and goats are numerous; and the soil is much fitter for maize and fruits than for wheat. The surface is mostly mountainous; and the ranges, which here and there are 2500 feet above the sea, are interspersed with barren flats of stone and sand.

**CO'RDOVAN**, a species of leather prepared from goat-skins. It was originally, and at one time exclusively, manufactured by the Moors of Cordova, and hence its name. The best C. still comes from the Levant. It is used in bookbinding, and in the finer kinds of boot and shoe making.

**CORDYLINE.** See TI.

**CORE'A** (native name, *Tio-cen-koak;* modern official name, *Chaosyen*), a peninsular kingdom of Eastern Asia, tributary to China. It is bound E. by the Sea of Japan; S. by the Strait of Corea; W. by the Yellow Sea; and on the N. by Mantchuria. Including the subject territory to the north of the peninsula proper, it extends from 34° to 43° N. lat., and lies between 124° and 134° E. long. Its extreme length is about 630 miles; breadth from 200 to nearly 300 miles; with an estimated area of 90,000 square miles. Very scanty information has been obtained of this country, from which foreigners, and especially Europeans, are rigidly excluded. The few French missionaries who ventured into C. were expelled or exterminated in 1839. Hendrick Hamel, the clerk of a Dutch ship wrecked on the coast in 1653, was, with the rest of the crew, detained a prisoner for 13 years; and from his accounts, the

French missionary annals, as well as the voyages of Captains Hall and Maxwell, our knowledge of this remote and unsocial state is derived. The west coast of the peninsula is studded with hundreds of small rocky islands—the Corean Archipelago—so that one of the titles of the sovereign—King of Ten Thousand Isles—is something more than an eastern hyperbole. The island of Quelpaerts, off the south-west coast, is 60 miles in circumference, and has a central mountain, 6000 feet above the level of the sea. C. is separated from Mantchuria by a lofty range of mountains, the *Shang-pe-shan;* and another range, the *Chim-tai*, branching off from these in a south-south-east direction, skirts the east side of the peninsula, to the Strait of Corea. The general slope of the land is towards the Yellow Sea.

The *Yalu-kiang* and the *Tumen-kiang* are the largest rivers known to Europeans; both are deep and rapid, and have their source in the Shang-pe-shan range. The former takes a western course, and empties itself into the Yellow Sea; the latter flows to the east, and falls into the Sea of Japan.

The climate of C. is severe, especially in the northern parts, where snow falls in great quantities; and we learn from Hamel that at *King-ki-tao* or *Kin-phu*, the capital, in 37° 38′ N. lat., the river Han-kiang was frozen so hard by the end of November, that loaded horses crossed upon the ice.

Gold, silver, lead, iron, rock-salt, and topazes, are said to be amongst the minerals of Corea. In the south, agricultural productions, such as rice, wheat, cotton, flax, ginseng, and tobacco, with fruits of many kinds, are raised in abundance; silk is also produced, and cultivation is diligently carried on; but the northern continental districts are mountainous, barren, woody, and thinly inhabited. Here wild animals, such as sables, martens, bears, deer, and boars, are plentiful; and the royal tiger is also a native of the country. Reptiles are numerous, and crocodiles, which sometimes attain the length of 30 or 40 feet, infest the rivers. The commerce of C. is confined to China and Japan.

The inhabitants, believed to be of Tartar descent, have been described as a fine, well-made race, with agreeable manners and prepossessing appearance. Their civilisation has been derived from China, and the Chinese language is used by the literati, who study the Confucian philosophy. Of the vernacular tongue, little or nothing is known, except that it belongs to the monosyllabic class of languages. Chinese Buddhism is the prevailing religion, and its temples and priests are numerous. The French Roman Catholic missionaries have made numerous converts. The population has been estimated at 10,000,000.

C. is divided into 8 provinces, and contains some 360 cities and towns. The government is a despotism, and all the lands are held from the sovereign, who claims one-tenth of the agricultural produce. He presents an annual tribute to the emperor of China, but the latter does not interfere in the internal administration of the country. The Corean sovereign appoints one of his sons as his successor, and his title is confirmed by the court of Pekin.

*Annales de la Propagation de la Foi;* Hamel; Captains Hall and Maxwell; Williams.

**CORE′GONUS**, a genus of fishes of the family *Salmonidæ*, having the first dorsal fin further forward than the ventrals, and higher than it is long, the scales large, the teeth either minute or wanting. The species are numerous, and some of them inhabit the sea, others fresh-water. To this genus belong the Gwyniad of the lakes of Wales and Cumberland, the Powan of Loch Lomond, the Pollan of the lakes of Ireland, &c. From their herring-like appearance, the Gwyniad and Powan are often called *Fresh-water Herring.* Some of the species found in the lakes and rivers of North America are also known as *Herring Salmon;* but a more valuable species, regarded as one of the finest of all fish, is the WHITE FISH (*C. sapidus* or *albus*) of North America. Other species are found in the rivers and lakes of Europe, even to the North Cape, in those of Siberia, &c.

**CORE′LLI**, ARCA′NGELO, surnamed *Il Divino*, an Italian musical composer, was born at Fusignano in the Bolognese, in 1653. He studied counterpoint with Matteo Simonelli, and the violin with Bassini. In 1672, he visited Paris, and in 1680, Germany, where he was well received. In the following year he returned to Italy, and fixed his abode at Rome, where in 1683 he published his *Twelve Sonatas for Two Violins and a Bass.* In 1685 appeared another set, bearing the title of *Balletti da Camera.* A third and fourth set were published at Bologna in 1690 and 1694. In 1700 appeared his sonatas for violin and bass, or harpsichord. This work is one of C.'s master-pieces, and has placed him in the first rank of instrumental composers. C.'s greatest effort was his *Concerti Grossi*, which appeared only six weeks before his death. The style of C. is one of the very best, and his works continue to the present day models of classical study in instrumental music.

**CORENTY′N**, a river of Guiana in South America, rises in lat. 1° N., having its head-waters 25 miles to the east of those of the Essequibo. With a generally northerly course, it separates the Dutch and British portions of the country; and at its mouth, in lat 6° N. and long. 57° W., it forms an estuary of 25 miles in width. It is navigable for boats about 150 miles upwards, measured by its windings; and at a point still higher, where further exploration was impeded by a series of cataracts, it was found to be 900 yards across. The C. is one of the streams by which Guiana possesses comparatively easy means of communication with the basin of the Amazon on the one side, and that of the Orinoco on the other.

**CORFE CASTLE**, a village in the middle of Purbeck isle or peninsula, in the south of Dorsetshire, 24 miles east-south-east of Dorchester. In the vicinity are stone and marble quarries, and clay-works for the potteries. Pop. 1966. A castle, giving its name to the village, stands on a neighbouring hill. It seems to have been founded in the 10th c., and was long one of the strongest fortresses in the kingdom. Here King Edward the martyr was murdered by his stepmother, Elfrida, about 980, and King John, during his disputes with his barons, kept his regalia here for safety. Here also, in 1642, Lady Bankes defended the castle for six weeks against Charles I. It was dismantled by Fairfax in 1645.

**CO′RFU**, the most northerly of the Ionian Islands (q. v.), in lat 38° 40′—39° 40′ N., long. 19° 10′—20° E. It has a length of about 38 miles, with a breadth varying from 3 or 4 to 20 miles. Area, 227 square miles. Pop. (1858) 85,262. Like the rest of the Ionian Islands, it is mountainous, and the mountains are generally naked and dry, the highest summit, Pandokrátora, being between 3000 and 4000 feet above the sea. The valleys, however, are very fertile, and yield olive-oil, wine, honey, oranges, figs, &c. Salt is also produced in some quantity. The climate is generally mild and healthy. The principal town, Corfu, is the capital of the Ionian Islands, the seat of the parliamentary senate and highest judicial court. It is also the residence of the British Lord High Commissioner, and of the archbishop of the Greek Latin Church. It is situated on an elevation, has some good streets, and an esplanade commanding a fine view and forming a fashionable promenade. The governor's palace, the university founded by Lord Guilford in 1824, and the cathedral, are among the principal buildings. The town is defended by two fortresses, and garrisoned by British troops. It has a population of about 20,000, and a considerable trade. Steamers ply regularly between the port and Malta, Patras, Alexandria, and Trieste. The language spoken is considered the softest of the modern Greek dialects.—The ancient name of the island of C. was *Corcȳra*. It is said to have been occupied first by the Phæacians, and then by the Liburnians; but the accounts of it are somewhat mythical until its settlement by the Corinthians about 734 B. C., and through its commerce it soon after acquired a considerable importance. It soon quarrelled with the mother-country, and after many vicissitudes of fortune, passed under the dominion of the Romans about 229 B. C.

**CORIA'NDER** (*Coriandrum sativum*), an annual plant of the natural order *Umbelliferæ*, with branching stem, 1—2 feet high, the lower leaves bipinnate, the upper leaves more compound, and globose fruit. It is a native of the south of Europe and of the east, and has long been cultivated for the sake of its fruit; and has thus become naturalised in some parts of England, although its fruit (*C. seed*) is much less used in Britain than in Germany, and some other European countries. The whole plant, when fresh, has a very offensive smell; but the ripe and perfectly dry fruit has an agreeable aromatic smell and a sweetish aromatic taste. It is used in medicine as a carminative, and as a corrective of certain purgatives; also in domestic economy as an aromatic, being very often mixed with bread in the north of Europe; spirituous liquors are flavoured with it; and confectioners cover it with sugar, to make a well-known kind of comfit. In the south of England, it is common to sow C. and caraway together, the C. yielding a crop in the first year, and the caraway in years following. C. delights in a rich soil, and is much cultivated and used in India.

**CORIGLIA'NO**, a town of Naples, in the province of Calabria Citra, about 4 miles from the Gulf of Taranto, beautifully situated on a hill, round which it is built in the form of an amphitheatre, a fine old castle crowning the summit. The base of the eminence is clad with lemon and orange groves, amid which rise some elegant villas; the whole rendering C. one of the most agreeable places in the Calabrias. It has extensive liquorice manufactories, and a trade in wine and fruits. Pop. 13,000.

**CORI'NGA**, a maritime town in the district of Rajahmundry and presidency of Madras, stands on the south side of the estuary of a river of its own name, one of the branches of the Godavery. Its harbour is breasted by a bar, which at spring-tide shews a depth of 12 or 14 feet. Besides having a considerable general trade, it is the best place on the coast for the building and repairing of small vessels. It has been twice destroyed by inundations of the sea. In May 1787, during the north-east monsoon, the tide overwhelmed the city and the adjacent country, drowning about 15,000 people; and again in 1832, a similar deluge occurred, leaving behind it, besides the more ordinary traces of its power, several ships lying high and dry in fields in the neighbourhood.

**CORI'NNA**, a Greek lyric poetess, famous alike for her beauty and genius, was born at Tanagra, in Bœotia. The date of her birth is not known, but she flourished about 500 B. C. She lived principally at Thebes, and hence is sometimes called a Theban. Ælian states that on five different occasions she vanquished her contemporary, Pindar, in a poetic contest, but Pausanius alludes to only *one* victory of hers. Her townsmen shewed their appreciation of her genius by placing a statue of her in their gymnasium. She was surnamed *Muia* ('the Fly'), probably on account of the tenderness and softness of her poems. Of her numerous poems, which were composed in the Æolic dialect, only a few fragments remain, which have been published by Schneidewin, in his *Delectus Poetarum Græcorum* (Gött. 1839), and by Bergk, in his *Lyrici Poetæ Græci* (Leip. 1843).

**CO'RINTH** (originally called *Ephyre*), a famous city of antiquity situated on the isthmus connecting the northern division of Greece, or Hellas proper, with the Peloponnesus. Its citadel was the Acrocorinthus, an isolated hill 1886 feet high, separated from the Oneian range on the north of the isthmus by a ravine, and forming, in the opinion of Colonel Mure, the most gigantic natural citadel in Europe, neither the Acropolis of Athens nor the fortress of Gibraltar being able even remotely to compete with it. At the northern foot of this hill lay the city of C., on a broad level rock nearly 200 feet above the level of the isthmus. It was probably founded by the Phœnicians, who had various settlements on the Grecian coast, and who could hardly have failed to notice the extraordinary maritime advantages of its situation. According to its legendary history, however, it was founded by Sisyphus, the Æolian, about 1350 B. C. It was then conquered by the Heracleidæ, who ruled as an oligarchy for twelve generations, when they were expelled by Crypselus, the father of Periander, with the help of the populace, 657 B. C. After a period of 77 years, the Spartans—the great enemies of democracy in Greece—established again a sort of aristocratic government, and C. now figures in history as the close ally of Sparta. In the Peloponnesian war, it at first furnished the greater part of the fleet employed against the Athenians, but afterwards became jealous of the Lacedæmonian power, and was induced to league with other Grecian states against it, 395 B. C. The war which ensued is known as the *Corinthian War*, and lasted till the peace of Antalcidus, 387 B. C. In the strife which broke out between Thebes and Sparta, C. remained faithful to the latter. After the battle of Chæroneia, 338 B. C., in which the liberties of Greece were crushed by the Macedonians, it was garrisoned and held by the latter. Subsequently, it was the centre of the Achæan league formed against the Romans, and in revenge was utterly destroyed (146 B. C.) by L. Mummius, the Roman general. For a whole century it continued in ruins. In 46 B. C., Julius Cæsar rebuilt it, and made it the capital of Achaia; and although it never again attained its former importance, it became both prosperous and powerful. St Paul planted a Christian church here, to which he also addressed two Epistles. Pausanius, who visited it in the 2d c. of the Christian era, states that it then contained numerous public buildings. At a later period it came into the possession of the Western emperors, from whom it passed into the hands of the Venetians. In 1458 A. D. it was conquered by the Turks under Mohammed II., recovered by the Venetians in 1687, and retaken by the Turks in 1715, who held it till 1823. It is now a small town, of 2000 inhabitants, who carry on a little trade in dried fruits, wheat, oil, honey, and wax.

Ancient C. was surrounded by walls which included the Acrocorinthus, and had two harbours—*Lechæum*, on the Crisæan Bay (now the Gulf of Lepanto), opening into the Adriatic; and Cenchreæ, on the Saronic Gulf (now the Gulf of Athens), opening into the Ægean. The former was connected with the city by two parallel walls. The vast wealth of its merchants was the bane of Corinth. It became notorious as the most licentious city in all Greece, and was the favourite resort of courtezans. The patron goddess of the city was Aphrodite, in whose temple, on the Acrocorinthus, were kept more than a thousand 'sacred female slaves' (*hierodouloi*) for the use of strangers. C., however, has better claims to remembrance. The art of painting is said to have been invented here, and at the time of its capture by the Romans, it possessed some of the finest pictures in Greece. Among these, was the picture of Bacchus, by Aristides, for which Attalus offered 600,000 sesterces. Architecture, statuary, and bronze-work also flourished, and earlier, during the reign of Periander, poetry was cultivated, Arion having either invented or improved the dithyramb in Corinth. Afterwards, however, no attention was paid to literature by the inhabitants, and it has been noticed that 'among the illustrious writers of Greece not a single Corinthian appears.'

**CORINTH, Gulf of, or GULF OF LEPA'NTO.** An arm of the Mediterranean extending from west to east through the centre of Greece, from the Ionian to within about 5 miles of the Ægean Sea, thus almost dividing the kingdom into two parts, the Morea forming the southern portion. Its greatest length is about 75 miles, with an average breadth of 15 miles. The outline of the coast is exceedingly varied, and the scenery is everywhere as attractive as it is rich in contrast. The narrow neck of land, separating the Gulfs of C. and Egina, and uniting the Morea to Attica, is called the ISTHMUS of Corinth. It is variously estimated, according as it is measured from different points, at from 10 to 20 miles in length, and its breadth varies from 4 to 8 miles. The project of cutting through this isthmus, in order to unite the Ionian and Ægean Seas, was one early entertained, and attempted to be carried out by Nero without success. To protect the Morea from land attack, however, a strong wall, flanked with towers, was built across the isthmus, and traces of it may still be seen, as well as of other remains of antiquity. The celebrated Isthmian games were contested upon this tract.

**CORI'NTHIAN O'RDER.** See COLUMN.

**CORINTHIANS, Epistles to the,** were written by St Paul, 57 or 58 A. D. The first was composed at Ephesus; the second, according to general opinion, at Philippi, but this is doubtful. The genuineness of both is all but universally recognised. From the contents of 1 Cor., chap. 5, verse 9, it has been concluded by many theologians that Paul must have written a previous epistle, now lost.

**CORIOLA'NUS, Caius or Cnæus Marcius,** a Roman patrician, surnamed, according to the half-fabulous legend, C., on account of his capture of the town of Corioli, belonging to the Volsci (493 B.C.). Of a proud and haughty spirit, he was strongly opposed to the plebeians, whom he looked upon as the 'enemies' of his order; and on one occasion, during a time of famine, he argued in the senate against a gratuitous distribution of the corn which had arrived from Sicily, and insisted that the plebeian tribunes, lately instituted, should first be discharged from office. For this he was impeached, and banished. He took refuge among the Volscians, whom he aided in their war with the Romans. His victories at the head of his Volscian troops alarmed the Romans, who, on his approach to their city, sent a variety of deputations to plead with him. He was deaf to every entreaty. At last, the noblest matrons of Rome, headed by his old mother and his wife Volumnia, leading her two children, came to his tent. His burning desire to be revenged on those who had dishonoured him was cooled by the tears of his relatives, and he led back the Volsci to their own territories, where he lived to an advanced age. Shakspeare has written a play on the subject, in which the character of C. is conceived in the grandest and most aristocratic style.

**CORK** (Span. *corcho*, from Lat. *cortex*) is the unusually developed *epiphlœum* (see BARK) of the bark of the C.-tree or C.-OAK (*Quercus suber*), the *Alcornoque* of the Spaniards, a species of Oak (q. v.), a native of the south of Europe and north of Africa. Spain and Portugal chiefly supply the world with C., and in these countries, the tree is often planted for the sake of the cork. The C.-tree is not of great size, generally 20—40 feet high, much branched, with ovate-oblong evergreen leaves, which are sometimes entire, and sometimes sharply serrated. The acorns are eatable, and resemble chestnuts in taste. The bark in trees or branches from three to five years old acquires a fungous appearance, new layers of cellular tissue being formed, and the outer parts cracking from distension, until they are finally thrown off in large flakes, when a new formation of the same kind takes place. C. intended for the market is generally stripped off a year or two before it would naturally come away, and the process is repeated at intervals of six or eight years. The bark of young trees and branches is either useless or of very inferior quality; it is only after the third peeling that good C. is produced. The removal of the C., being not the removal of the whole bark, but only of external layers of spongy cellular tissue, all or greater part of which has ceased to have any true vitality, and has become an incumbrance to the tree, is so far from being injurious, that when done with proper care, it rather promotes the health of the tree, which continues to yield crops of C. for almost 150 years. In stripping off the C., longitudinal and transverse incisions are made to the proper depth, and each piece is then cut away from the tree by a curved knife with two handles. The pieces are soaked in water, pressed flat, dried, and superficially charred, to remove decayed parts and conceal blemishes, before they are packed in bales for the market. Besides the use of C. for stopping bottles, casks, &c., it is much used, on account of its lightness, for floats of nets, swimming-belts, &c.; and on account of its impermeability to water, and its being a slow conductor of heat, inner soles of shoes are made of it. All these uses are mentioned

Cork Tree.

by Pliny; but the general employment of corks for glass bottles appears to date only from the 15th century. The *Spanish Black* used by painters is made by burning C. in close vessels, and the parings of C. are carefully kept by C.-cutters for this purpose. There are many other applications of this valuable substance in the arts, which cannot here be detailed.

The C.-tree is occasionally planted in the south of England, but the climate is not sufficiently warm.

The wood of some trees possesses the cellular sponginess, lightness, and elasticity of C. in such a degree as to be sometimes substituted for it in many of its uses, as that of the *Anona palustris* (Corkwood, or Alligator Apple) in the West Indies, &c.

CORK-CUTTING. The bark, after being cut into square pieces or sheets, is pressed, to remove its natural curvature and flatten it. If it is found that simple pressure has not flattened it sufficiently, it is heated on the convex side, and the contraction thus produced straightens it. It is then cut into slips, and these slips into squares, according to the required size of the corks. These are rounded by the cork-cutter by means of a broad sharp knife; the cork is held in the left hand, and rested against a block of wood, and the knife pushed forward, and at the same time its edge is made to describe a circular curve by a skilful turn of the wrist. The knife requires continual sharpening; the workman has a board before him on which the knife is rubbed on each side *after every cut.*

Many attempts have been made to cut corks by machinery. A patent C. company was established a few years since, but it failed. The chief difficulty in applying machines to this purpose arises from the necessity of continually sharpening the knife or cutters, for it is a curious fact, that so soft a substance as cork blunts the tools used in cutting it far more rapidly than do the hardest or toughest of metals. A cork-cutter's knife requires sharpening every second, while the tool that is used for planing, turning, or boring steel will work continuously for hours without sharpening. In most of the machines, the corks, after being cut into squares of the required length, are made to revolve on grasping spindles; and cutters of various forms, such as revolving cutter-wheels, hollow cones with internal cutters, reciprocating blades, toothed cutters, &c., are brought to bear upon the revolving cork.

**CORK**, ROCK. See ASBESTUS.

**CORK**, a municipal and parliamentary borough, and river-port of Ireland, capital of the county of the same name, is situated on the river Lee, where it divides into several branches, 11 miles above the entrance of the noble landlocked harbour, into the Atlantic. The city stands in the centre of the valley of the Lee, amid high grounds and beautiful scenery. The central part of it is built on an island, formerly a swamp, which the word Cork, Corroch, or Corcagh implies. The rest of the city lies on the north and south slopes of the river-banks. The houses are generally built of old red sandstone, with the fronts often weather-slated. Nine bridges cross the river to the central islands. Two hundred and forty acres of land reclaimed from the river form a public park, and there is a public walk, a mile long and lined by noble elms, on the west of the city. C. has a pleasant picturesqueness from its uneven ground, irregular streets, intersecting river, and overhanging heights. The chief buildings are St Anne Shandon's Church, conspicuous for its tower, 170 feet high; 4 monasteries; 2 nunneries; the plain palace of the Bishop of Cork, Cloyne, and Ross; and Queen's College, a fine Tudor-Gothic quadrangular building, opened in 1849. The banks of the Lee above and below C. are richly planted, and studded with villas. C. harbour, noted for its size and safety, could contain the whole British navy, and has been the main source of the rise and progress of the city. It is a basin of 10 square miles, shut in by hills, and is formed by the estuary of the Lee, which is navigable to about a mile above the city, the tide flowing up thus far. The estuary contains several large isles, rising abruptly and high above the water, with narrow channels between them. The entrance is by a channel two miles by one, defended by batteries. Spike, Hawlboline, and Rocky Islands, which are occupied by convict and ordnance depôts, artillery barracks, and a powder-magazine, are within the harbour, and are strongly fortified. On the shores of the estuary are the towns of Passage and Queenstown, formerly Cove of Cork. C. harbour is much frequented by wind-bound ships and ships waiting orders. Vessels of 600 tons reach C. quays. In 1859, 4370 vessels, with an aggregate burden of 753,625 tons, entered and cleared the port. The chief manufactures are leather, iron, gloves, ginghams, frieses, and flour. There is also much distilling and brewing. The chief exports are grain, provisions, butter, live-stock, and linen, valued at several millions sterling yearly. Pop. 90,022, of whom about five-sixths are Roman Catholics. C. returns two members to parliament. C. seems to have arisen in an abbey founded in 600 by St Finbar, and having 700 scholars. The Danes in the 9th c. built the city walls. Dermod Maccarthy, king of Cork or Desmond, surrendered it to Henry II. in 1172. Cromwell besieged and took it in 1649, and Marlborough in 1690. James II. landed at C. in 1688. In C., William Penn, the founder of Pennsylvania, became a Quaker, with several of the soldiers of the republican garrison.

**CORK**, a maritime county in the south-west of Ireland, in Munster province, the southmost and largest of the Irish counties. It is bounded on the N. by Limerick, E. by Tipperary and Waterford, S. by the Atlantic, W. by Kerry. Greatest length from east to west, 110 miles; greatest breadth, 70; average, 34. Area 2885 square miles, about two-thirds of which are arable. C. is hilly, with great variety of surface. The west part is rocky, mountainous, wild, and boggy; the east and south, rich, fertile, and picturesque. The ranges run east and west, except the Boghra Mountains, which spread out with a deep boggy surface between the Lee and Blackwater. The coast is bold and rocky, and from its indentations, 250 miles long, the bays, which run 3 to 25 miles inland, admitting large vessels. The chief bays are Bantry, Dunmanus, Clonakilty, Kinsale, Cork Harbour, and Youghal. There are many isles off the coast, the chief being Whiddy, Bear, Innissherkin, Great Island, and Cape Clear, in lat. 51° 25′ N. and long. 9° 30′ W., and, with the exception of a rock 4 miles to the south-south-west, the southmost point in Ireland. In the west, C. is divided from Kerry by a range of Silurian clayslate, running north-east and north, the chief points being 1200 to 2200 feet high. This range sends offshoots to the east, which divide the county into the parallel basins of the three chief rivers of C., the Blackwater, Lee, and Bandon; the lower parts of these basins are well cultivated and productive. The basins of the Lee and Bandon consist of red and yellow Devonian sandstone, with some beds of lower carboniferous limestone. This limestone, as in other parts of Ireland, forms the largest lowland tracts and valleys of the county. The Blackwater basin also consists of Devonian strata, but with more limestone. Part of the Munster coal-field occupies 400 square miles in the north-west of the county, with a cold, stiff, moory soil over it. The river-beds generally mark the limestone tracts. C. has many small lakes in the west. One of these lies at the source of the Lee, amid wild picturesque scenery, with the ruins of a chapel on an islet frequented by pilgrims. The chief mineral productions are coal and iron, copper, the mines of which are the richest in Ireland, limestone, fine dark-gray marble, rich in fossil shells, fullers' earth, brick-clay, marl. There is a thermal magnesian spring at Mallow. The climate is moist, but genial, like that of Devonshire. The soils are calcareous, loamy, and moory. In 1858, a third of the county was in crop, the chief crops being oats, wheat, and potatoes. The dairies are extensive, and C. butter stands in high estimation. The chief manufactures are linen, whisky, porter; and the chief exports provisions. Pop. 1841, 854,118; 1851, 653,180. C. returns two members to parliament. The antiquities of C. are stone circles, Druid altars, two round towers, circular earthworks or raths; besides the ruins of many abbeys and churches, chiefly built by descendants of English invaders under Henry II.; and many ancient castles or square towers of great historical interest.—Bandon (accidentally omitted in its proper place) is a parliamentary borough in the south of C. county, on the river Bandon, 19 miles south-west of C. city, in a fine undulating pastoral tract. It was founded in 1608 by R. Boyle, first Earl of Cork. Pop. 1841, 9049; 1851, 6929. It returns one member to parliament. Bandon has manufactures of fine stuffs, whisky, beer, leather, and flour.

**CORLEO'NE**, a town of Sicily, in the province of Palermo, about 21 miles from the city of that name. It is situated on a hill near the source of the Belici, and is well built. Its principal public structures are convents and churches. Its inhabitants, about 12,500 in number, are chiefly engaged in agriculture.

**CORM** (Gr. *kormos*, a stump)—sometimes called a *solid bulb*—the short and bulb-like subterranean stem of many endogenous plants. It annually produces buds in the form of small corms, either from its summit or its side; and these gradually exhaust and destroy it. In functions, as in appearance, the C. resembles the Bulb (q. v.), but its structure is different; it does not consist chiefly of scales, as a bulb does, but of a solid axis covered only with thin membranes. Examples may be seen in the tulip, crocus, gladiolus, colchicum, and arum. When a C. produces young corms from its summit, as in the crocus, they approach in a few years the surface of the soil, however deeply they may at first have been planted.

**CORMENIN**, Louis Marie de la Haye, Vicomte de, a distinguished French jurist and publicist, was born at Paris, January 6, 1788. Educated for the law, he was, in 1810, appointed auditor of the Council of State, and drew up several of its most important reports. He was elected a deputy in 1828, and from that time until 1846, continued to be re-elected at every election, sometimes by as many as four departments at once. His extensive knowledge of jurisprudence, and of the practical affairs of government, and the clear and logical force with which he could present his ideas alike by speech and writing, soon secured him an immense influence in public affairs. After the revolution of 1848, C. had the honour of being elected to the Chamber by four departments, and was nominated president of the commission appointed to remodel the constitution; and in this capacity strongly advocated universal suffrage. He was appointed member of the Council of State reconstituted after the *coup d'état*. In 1855, he was elected a member of the Institut. Besides his numerous pamphlets, C. is author of *Etudes sur les Orateurs Parlementaires*, a two-volume work which has passed through nearly twenty editions; and of a valuable work in two volumes on the administrative law of France (*Droit Administratif*), which has also gone through several editions.

**CO'RMORANT** (*Phalocrocorax*; Fr. *cormorant*; Ital. *corvo marino*; Bret. *morvrau*, a sea-crow; Welsh, *mor*, sea, and *brau*, a crow), a genus of web-footed birds of the family *Pelecanidæ* or *Totipalmati*, having, like the rest of that family, the hind-toe united in a single membrane with the other toes; and also characterised by a bare dilatable membrane beneath the lower mandible, extending to the upper part of the throat, but not forming a great sac on the throat, as in the pelicans; a compressed bill, rounded above, and with a strong hook at the point of the upper mandible; the nostrils linear, and seemingly impervious to air; the claw of the middle toe serrated, apparently in order that it may be used in trimming the plumage; the wings of moderate length; the tail-feathers stiff and rigid, and used to aid in walking or climbing. The species are distributed over the coasts of most parts of the world; some of them occasionally ascending rivers in pursuit of fish, on which all of them exclusively live, and even visiting inland lakes. They are proverbial for their excessive voracity. They do not take their prey by diving when on wing, but pursue it by swimming and diving, using their wings in progress under water, and descend to a wonderful depth; the smaller of the two British species has been caught in a crab-pot fastened 120 feet under water. When the prey has been caught in a manner inconvenient for swallowing, they toss it in the air, and adroitly catch it as it descends. Some of the species frequent high rocks, others low islands, on which they make rude nests, chiefly of sea-weed; some perch and even build their nests on mangroves and other trees. Their eggs are covered with a calcareous incrustation. The flesh of all the species is dark and of a fishy taste, but is sometimes used as food, particularly that of young birds. The British species are the Common C. (*P. carbo*), which is mostly of a black colour, but for a short time during the breeding-season exhibits a sprinkling of longish white, almost bristly feathers on the head and back of the neck; and the Green C. or Shag (*P. graculus*), which is of smaller size, and of a prevailing dark-green colour. The Common C. is about 33 inches long. It is a very widely

Cormorant.

distributed species. It was formerly sometimes tamed in England, to be employed in catching fish, and is still trained to this use in China.

**CORN** (Ger. *Korn*) meant primarily any small, round, hard body, like a seed. This general meaning is still seen in its application to concretions on the feet. It is allied to the Lat. *granum*, grain; and to Ger. *Kern*, kernel. As usually applied, C. is a generic name for all seeds used in making bread, especially the seeds of cerealia. But it has also a specific sense, and denotes in any country that grain which furnishes the prevalent bread-stuff of the people. Thus, in England, C. means *wheat;* in America, it means *maize;* and in Scotland, *oats.*

**CORN LAWS**, the name popularly given to certain statutory enactments which had for their object a restriction of the trade in grain. The English C. L. date as far back as the year 1360, in the reign of Edward III. Before this period, there seems to have been a general rule carried into effect by the crown against the exportation of any grain; and the act of 1360 enacts the prohibition, but at the same time excepts Calais and Gascoigne, with any other places which the king may appoint by licence, from its operation. In 1393, the arrangement was reversed, and the right to export was made general, unless to those places to which it was prohibited by royal proclamation. An act of 1436 permitted exportation when the price of wheat did not exceed 6*s.* 8*d.* per quarter. Hitherto, there seem to have been no prohibitions against importation; but in 1463, an act was passed prohibiting it so long as the price at home was below the 6*s.* 8*d.* at which there was free exportation. The next change was in the reign of Henry VIII., when an act of 1534 prohibited all exportation except by licence specially granted under the great seal. This act was not found to work well; and twenty years later, the previous arrangement was adopted of allowing exportation when the price had reached a certain point. The subsequent legislation for some time merely changed the price at which exportation might begin, generally enlarging it. After the Restoration, the policy of increasing the duties on importation, for the protection of agriculture and the landed interest at home, begins to be perceptible. At the same time, the effect of that event on the condition of Scotland and England towards each other forms a curious illustration of such fiscal regulations. Under the Protectorate, they were one country, with free intercommunion of trading privileges. Scotland was increasing in wealth under this arrangement; but the countries were separated by the restoration of Charles II., and became the same to each other as foreign nations. The English duties restricted the importation of grain from Scotland; and in 1663, the Scotch parliament, in retaliation, laid heavy duties on the importation of English and all other foreign grain. Had not the union of 1707 made the countries one again, England and Scotland would probably have continued a corn-law contest against each other, like the French provinces.

The agricultural interest continuing powerfully to modify this department of legislation, an act was passed in 1670, for virtually prohibiting importation, until the home-price had reached 53*s.* 4*d.*, and laying a heavy duty on it above that point. This law had, however, little effect in favour of the landed interest, from the circumstance, that then, and for long afterwards, Britain was an exporting, not an importing country—that is to say, it generally produced more corn than its population required. A new device was adopted at the Revolution, and a bounty was awarded on exportation—that is, a sum was paid to the producer for what he exported, so that if the price in the foreign market might not induce him to send corn abroad, the bounty, in addition to that price, might. For upwards of a century, the numerous enactments in this department will be found to be a mere shifting, according to circumstances, of the incidence of the bounty on the one hand, and of the import duty on the other. In 1773, a permanent adjustment was supposed to be reached by Burke's act, which removed the bounty, and prohibited exportation when the price reached 44*s.*, and allowed importation at a nominal duty of 6*d.*, at a price of 48*s.* Afterwards, and especially during the great war of the French Revolution, it became usual to profess that the chief object of this kind of legislation was to have always a sufficient supply of grain at home for our own wants, and to render us entirely independent of foreign nations for the food of the people. It was maintained that the bounty effected this object, since its tendency was to promote the production of more grain than was necessary at home, and it thus supplied a granary to be drawn upon in case of famine. It was otherwise, however, maintained, that the prohibiting, or, at all events, restraining the introduction of foreign grain, would give a much greater impulse to home production. Looking at it from the agricultural interest solely, this view was well founded; for, as the tendency of Britain to be an importing rather than an exporting country was increasing, the exportation, even with the encouragement of the bounty, was likely to be small. It could not, however, escape consideration, that to increase home production by a pressure on importation, was virtually to aggrandise the landed interest by a pressure on the food of the people. With these views, the price at which importation might begin was raised in 1804, and was again raised in 1814, when the bounty was abandoned as worthless for its purposes. There had been a tendency to what is called 'a sliding scale' in the duties on importation. This arrangement was brought into systematic shape by the act of 1814, and subsequently, by the celebrated act of 1828, it reached what was considered by its supporters a state of perfection.

Throughout these various changes there were not wanting writers and speakers who denounced the C. L., and agitated for their removal. But the public at large, though conscious that the laws were some way improper, or at variance with the principles of political economy, did not, till the very last, earnestly unite in calling for repeal. There was a powerful party who defended the C. L., and represented, with wonderful plausibility, that these restrictive statutes were identified with the best interests of the country. Their arguments might thus be summed up: 1. Protection was necessary, in order to keep certain poor lands in cultivation. 2. It was desirable to cultivate as much land as possible, in order to improve the country. 3. If improvement by that means were to cease, we should be dependent on foreigners for a large portion of the food of the people. 4. Such dependence would be fraught with immense danger; in the event of war, supplies might be stopped, or our ports might be blockaded, the result being famine, disease, and civil war. 5. The advantage gained by protection enabled the landed proprietors and their tenants to encourage manufactures and trade; so much so, that if the C. L. were abolished, half the country shopkeepers would be ruined; that would be followed by the stoppage of many of the mills and factories; large numbers of the working-classes would be thrown idle; disturbances would ensue; capital would be withdrawn; and no one would venture to say what would be the final consequences. It cannot be uninstructive to put on record that these arguments exercised a commanding influence over the labouring-classes, the small-town shopkeepers, almost all the members of the learned professions, and a considerable section of both Houses of parliament. Ignorance, prejudice, and timidity were united with selfishness in maintaining the C. L.; and in point of fact, those who endeavoured to represent the impolicy of a restricted trade in corn, were generally set down as little better than mischief-makers. The most surprising thing of all was, that the statesmen who ultimately joined in condemning the C. L., could contemplate no other modification than an ascending and descending scale of duties, according as prices fell or rose in the market. About 1840, there was no term better known than that of the *sliding scale*. The object of this device was to reduce the import duty as the price of grain increased, for the purpose of virtually prohibiting the importation when the price was low, and encouraging it when the price was high, so that at famine-prices grain might come in duty free. By the act of 1828, the price of 62*s.* a quarter on wheat was taken as the turning-point. At that price, the import duty was £1, 4*s.* 8*d.* For every shilling less in the price, a shilling was added to the duty. When the price rose above this point, a different gradation ruled, the duty decreasing by a larger ratio than the rise. Thus, when the price was 69*s.*, the duty was 15*s.* 8*d.*; and when it rose to 73*s.*, the duty sunk to its minimum of 1*s.* The effect of this fluctuation in rendering the trade a gambling one was, one would think, obvious, and yet it was not acknowledged until it had been proved by a series of ruinous instances. Thus, an importer who, when the price of grain was 73*s.* a quarter, bought a cargo, if the price sunk 4*s.* before he could accomplish a sale, had not only to sell at that reduced price, but with a further reduction of 14*s.* 8*d.* a quarter paid as duty. What was still more important, the supplies to this country being so capricious and irregular, foreign countries did not grow corn habitually for the British market. In 1843, Sir Robert Peel tried a modification of the sliding scale, which did not in the least degree mitigate the hostility to the C. L., the noxious nature of which was now beginning to be better understood. Roused by the addresses of Mr Cobden, Mr Bright, and other leaders of the ANTI-CORN-LAW LEAGUE (q. v.), the people poured in petitions to parliament; and at length Sir Robert Peel, yielding to representations on the subject, and now avowedly a convert to FREE-TRADE (q. v.), carried a measure to put an end to the C. L. in 1846.

The results of the repeal are well known. Every evil prognostication has been falsified. Poor lands are as much cultivated as ever, and even more so. There has been no stoppage of imports by war or otherwise, nor are there likely to be. Manufacturers and shopkeepers have thriven better than previous to the repeal. Instead of falling, the rent of land of all kinds has risen, and tenants and proprietors are alike satisfied. The working-classes are better instead of being worse employed. In place of disorder, there is general contentment. The liberation of the trade in corn has not, however, lowered the price of bread to the extent that some persons anticipated. This is accounted for as follows: an increased demand in consequence of the population increasing in numbers, and also improving in means and taste; the cost of freight and other charges virtually protect the home-grower to the extent of several shillings a quarter; and a small duty of one shilling a quarter is still exigible, in order to pay the cost of registering imports. To these causes might be added, the misdirection of capital from agriculture to manufactures in the United States, by which the export of bread-stuffs from that country has never been fully developed. The substantial benefits arising from the repeal of the C. L. consist in the stimulus given to trade, the removal of apprehensions as to the effects of insufficient harvests, along with a certain modification and less fluctuation in price. No longer a gambling kind of trade, involving large capital, corn-dealing has subsided into an ordinary branch of commerce, which is pursued by a largely augmented number of merchants. The following tables will convey the best illustration of the effects of repeal of the corn laws:

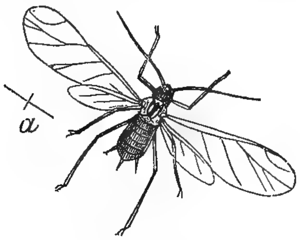
IMPORTS OF FOREIGN WHEAT, CURRENT PRICES OF WHEAT, AND DECLARED VALUE OF ALL BRITISH EXPORTS, FROM 1801 TO 1859.

| Average Periods of Ten Years. | Average Amount of Wheat Imported. | Average Price of Wheat during each Period. | | Average Total declared Value of all British Exports. |
|---|---|---|---|---|
| | Bushels. | *s.* | *d.* | £ |
| 1801 to 1810 | 600,946 | 81 | 5 | 40,737,970 |
| 1811 " 1820 | 458,578 | 84 | 11 | 41,506,794 |
| 1821 " 1830 | 534,992 | 58 | 3 | 36,600,536 |
| 1831 " 1840 | 907,638 | 56 | 10 | 45,249,037 |
| 1841 " 1850 | 2,877,999 | 53 | 3 | 57,412,494 |
| 1851 " 1859 | 4,547,311 | 54 | 9 | 103,253,189 |

TOTAL AMOUNT OF WHEAT AND FLOUR, AND OTHER GRAIN AND MEAL IMPORTED IN 1844, 1849, 1854, AND 1859, DISTINGUISHING THE COUNTRIES WHENCE RECEIVED.

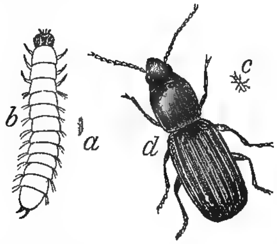
| COUNTRIES. | 1844. | 1849. | 1854. | 1859. |
|---|---|---|---|---|
| | Quarters. | Quarters. | Quarters. | Quarters. |
| Russia, Northern Ports, . | 97,143 | 840,633 | 168,847 | 1,020,461 |
| " Southern Ports, . | 104,292 | 572,735 | 539,856 | 1,384,030 |
| Denmark and the Duchies, . | 656,576 | 1,311,086 | 876,269 | 1,022,255 |
| Prussia, . . . . | 981,374 | 1,354,691 | 728,974 | 1,011,048 |
| Hanse Towns, . . . | 129,803 | 596,673 | 420,489 | 298,494 |
| Other Parts of Germany, . | 215,224 | 416,023 | 365,190 | 175,034 |
| Holland, . . . . | 80,216 | 586,739 | 250,358 | 192,808 |
| France, . . . . | 58,265 | 1,019,410 | 224,712 | 2,249,430 |
| Spain, . . . . . | 13 | 26,370 | 231,503 | . . . |
| Italian States, . . . | 96,727 | 406,034 | 117,947 | 197,041 |
| Wallachia, Moldavia, . | . . . | 325,128 | 147,090 | 705,290 |
| Turkish Dominions, not otherwise specified, . | 26,389 | 423,976 | 303,083 | 312,934 |
| Egypt, . . . . | 96,047 | 392,727 | 588,969 | 674,257 |
| British North America, . | 258,784 | 181,622 | 84,757 | 82,499 |
| United States, . . . | 107,812 | 1,816,425 | 2,136,223 | 109,275 |
| Other Countries, . . . | 122,016 | 899,389 | 725,277 | 835,918 |
| Total, . . . | 3,030,681 | 10,669,661 | 7,909,544 | 10,270,774 |

**CORN A'PHIS**, or **WHEAT A'PHIS** (*Aphis granaria*), a species of *Aphis* (q. v.), or Plant Louse, which is sometimes injurious to corn-crops, appearing in great numbers on the ears, sucking the juices of the plant, and so impoverishing the grain. It infests wheat, barley, and oats. The male is green, the female dull orange.



Corn Aphis:
*a*, natural size.

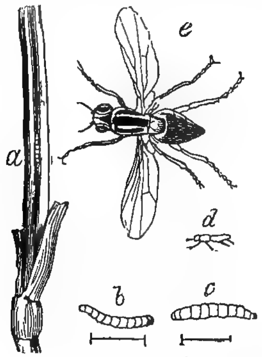
**CORN BEE'TLE** (*Cucujus testaceus*), a minute beetle, which inhabits granaries and mills, and of which the larva often does much mischief, feeding, like the weevils, on grain, particularly on wheat. The perfect insect is of a bright fulvous colour; the larva ochreous, with a forked tail.



Corn Beetle:
*a*, larva, natural size; *b*, larva, magnified; *c*, perfect insect, natural size; *d*, perfect insect, magnified.

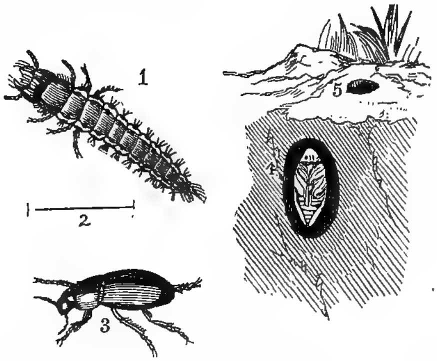
**CORN CRAKE.** See CRAKE.

**CORN FLY**, the common name of a number of small dipterous (two-winged) insects, of the large family *Muscides*, particularly of the genera *Chlorops* and *Oscinis*, which do great injury to corn crops. The most destructive in Britain is *Chlorops tæniopus*, a fly about a line and a half in length, of a pale-yellow colour, with black stripes, which deposits its eggs between the leaves of young plants of wheat or barley. The maggots living on the juices of the plant produce the disease which, from the swelling of the joint, is called *gout;* and the plant, impoverished, either produces no ear, or an imperfect and partially shrivelled one.



Corn Fly (*Chlorops tæniopus*):
*a*, a portion of a culm or stem of wheat with swollen joint, caused by larva of corn fly; *b*, larva; *c*, pupa; *d*, fly, natural size; *e*, fly, magnified.

**CORN GROUND BEETLE** (*Zabrus gibbus*), an insect of the order *Coleoptera*, section *Pentamera.* It is about six lines in length, of a shining pitchy black colour, with rusty jaws and legs, very broad and convex, the wings large, the antennæ short and slender. It burrows in the ground, climbs the stalks of wheat and barley by night, and devours the ears. The larva is of a remarkable appearance, whitish, with brown head and thorax, and a brown stripe down the body, powerful jaws, six thoracic legs, and little tufts of hair along the sides of its elongated tapering abdomen. It burrows in the earth, and eats the stems of corn close to the surface of the ground.

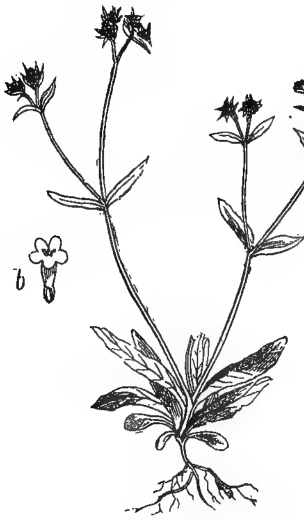


Corn Ground Beetle:
1, larva, magnified; 2, natural size of larva; 3, perfect insect, female, slightly magnified; 4, a cell containing pupa; 5, a burrow.

**CORN MOTH** (*Tinea granella*), a small species of moth of the same genus with the Clothes' Moths (q. v.). This moth is satiny and of a cream-white colour; the superior wings marbled with gray, brown, and black, and when at rest sloping like the roof of a house, their fringe turned up behind like a tail. It abounds in spring and summer, and lays its eggs either among stored grain or in sheaves in the field. The eggs are so small as to be invisible to the naked eye. The larva, or CORN WORM—which, for its voraciousness, is known as *the wolf*—eats into the grain, and attaches grains together by a web. It attacks indifferently any kind of grain; sometimes also books, articles of pasteboard, woollen stuffs, and even wood. Frequent turning of heaps of corn is resorted to for the destruction of the eggs and larvæ, and salt is for the same purpose mixed with corn; the floors, walls, ceilings, beams, &c., of granaries are scrubbed with hot water and soap, or washed with lime and water, sprinkled with vinegar, &c.; and lamps are employed to attract and kill the moths.—Another very troublesome moth, also called C. M., is *Butalis cerealella*, which is not yet known in Britain, but is found in some parts of Europe and America.

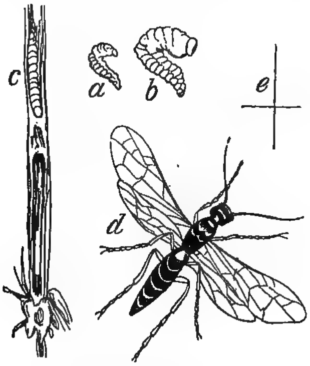
**CORN RENT.** See RENT, LEASE.

**CORN SA'LAD**, or **LAMB'S LET'TUCE** (*Fedia* or *Valerianella*), a genus of plants belonging to the natural order *Valerianaceæ*, having a toothed calyx and 5-fid corolla, three stamens, and a 3-locular fruit, crowned with the calyx. The species are annual plants of humble growth, with repeatedly forked stems, and very small flowers, growing in cultivated grounds, &c. Several species, very closely resembling each other, are natives of Britain, and others are found on the continent of Europe. Some of them are frequently used as spring salads, and sometimes as a substitute for spinage, particularly the common C. S. (*F.* or *V. olitoria*), the most abundant species in Britain, the *Mâche* of the French, *Rapunzcher* of the Germans. It is a favourite salad in France and Germany, although it is mucilaginous, and wants pungency. The lower leaves are somewhat spoon-shaped, the upper leaves oblong. The plant is extremely easy of cultivation, and can be obtained in the very first days of spring, when vegetables are scarce. The Vineyard Salad of the Germans (*F.* or *V. carinata*), and Italian C. S. (*F.* or *V. eriocarpa*), are sometimes preferred for their larger leaves or finer flavour.



Corn Salad:
*b*, a flower.

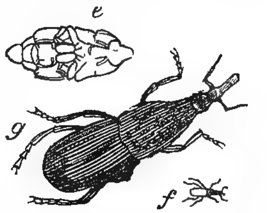
**CORN SAW'FLY** (*Cephus pygmaeus*), a species of Sawfly (q. v.) which sometimes does much mischief in cornfields, particularly to wheat and rye; the female, by means of her ovipositor, laying her eggs in the stems either below the first joint or just under the ear; the larva consuming the inside of the stalk, sometimes perforating the joints, and at last cutting it through near the ground, and undergoing its transformation into the pupa state in the stump which remains. The C. S. is almost half an inch long, of a very slender form, shining black with some yellow markings; the larva is fat, tapering, wrinkled, and yellow. The fly is often to be seen on the flowers of umbelliferous plants.



Corn Sawfly:
*a*, maggot, natural size; *b*, maggot, magnified; *c*, the maggot in its ear in the stem of the corn; *d*, female insect, magnified; *e*, female insect, natural size.

**CORN THRIPS** (*Thrips cerealium*), a minute insect, not quite a line long, often abundant on flowers, and which does much mischief to grain crops, particularly late-sown wheat, insinuating itself between the chaff and the immature grain, which it causes to shrivel; also at an earlier period causing the abortion of the ear, by puncturing the stalks above the joints and sucking the juice. The C. T. is of a shining pitchy black, the body long, the male wingless, the female having four narrow wings, which are fringed with long hairs; the larva is yellow, as is also the pupa, which is active. See Thrips.

**CORN WEE'VIL** (*Calandra granaria*), a coleopterous insect of the family *Curculionidæ*, which although a small creature, not quite two lines long, is often extremely destructive to grain stored in granaries. It is much more common in the southern than in the northern parts of Europe. The perfect insect is of a dark chestnut or reddish pitchy colour, with short oval wing-cases, but without wings, the thorax much marked with depressed dots, the head elongated into a proboscis, the antennæ bent at right angles. The female makes a little hole in a grain of corn, and deposits an egg in it, the larva feeds on the farina; and as a single female lays many eggs, and perfect insects are soon produced from them, the mischief, unless counteracted, extends very rapidly. To arrest it, however, has always been found extremely difficult; and the most successful method is said to be that of making a little separate heap of grain, which, being left unstirred, whilst the greater heap is stirred very frequently, soon becomes the refuge of the weevils, particularly if it is a heap of barley, of which they are fondest, although they will eat any grain, and there they are killed by boiling water.—Of the same genus are the Rice Weevil (*Calandra Oryzæ*), and a large South American insect (*C. palmarum*), an inch and a half long, the grub of which lives in the stems of palms, and is eaten as a delicacy both by Indians and Creoles. For the above illustrations of corn insects we are indebted to Morton's excellent *Encyclopædia of Agriculture.* Blackie, London and Glasgow.



Corn Weevil:
*e*, pupa, magnified; *f*, insect, natural size; *g*, insect, magnified.

**CORNA'CEÆ**, a small natural order of exogenous plants, containing about 40 known species, chiefly trees and shrubs, with a few herbaceous plants. The leaves are simple, without stipules; the flowers in heads, umbels, or corymbs. The calyx is 4-lobed or 4-toothed; the petals 4, equal, oblong, broad at the base, inserted into the upper part of the tube of the calyx; the stamens 4, alternate with the petals; the ovary is adherent to the tube of the calyx, 2—3-celled, crowned by a disk; the ovules solitary; the style filiform; the stigma simple; the fruit is fleshy and drupe-like. The C. are natives of the temperate parts of the northern hemisphere. The fruits of some are eatable; the bark and leaves of some are medicinal; some are valued as ornamental plants. Cornel, Dogwood, Aucuba, and Benthamia are examples.

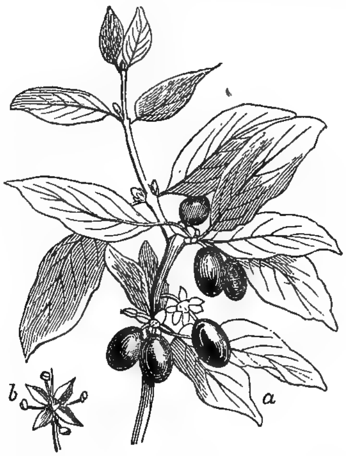
**CORNA'RO**, Lodovico, a Venetian nobleman, born 1467, is remembered on account of his instructive example of temperance. His constitution, naturally not strong, was greatly injured by intemperate eating and drinking, with other excesses; so that, when forty years of age, he appeared to have little hope of prolonged life. At this time he adopted strict rules of temperance both in meat and drink, which, co-operating with his general care of health and gentle exercises of various kinds, served to extend his life to nearly 100 years, as he died, according to the best authorities, in 1566. His old age was remarkably cheerful. To promote those habits which had proved so advantageous in his own case, he wrote, in his 83d year, his celebrated treatise, *Discorsi della Vita Sobria* ('Essay on Temperate Living'), which was first published at Padua in 1558, and has been translated into all European languages. The best English translation is one bearing date 1779.

**CO'RNBRASH**, a member of the Lower Oolite, consists chiefly of a rubbly cream-coloured limestone in thin layers, always nodular and concretionary, each fragment having a deep-red coating. Occasional beds of clay occur interstratified with the limestone. The whole thickness of the group rarely exceeds 15 feet. The C. is extremely rich in Echinodermata and Mollusca, with the exception of Cephalopoda, the abundant Oolite genus Belemnites being unaccountably wanting.

**CO'RNĔA**, one of the coats of the eye; so called from its resemblance to horn (Lat. *cornu*). See Eye.

**CORNEILLE**, Pierre, the creator of French tragedy, was born June 6, 1606, at Rouen, where his father was an advocate. He himself studied for the legal profession. A love adventure, in which he became the rival of a friend, first prompted C. to write verses, and *Mélite*, the comedy founded on this incident, was performed with success in 1629. It was quickly followed by other dramatic pieces: *Clitandre*, *La Veuve*, *La Galerie du Palais*, *La Suivante*, and *La Place Royale*—all so successful that a special theatrical company was formed for the performance of C.'s pieces. In 1635 appeared his *Médée*, a declamatory drama, written in imitation of Seneca. Cardinal Richelieu, who aspired to be the Mecænas of the stage, kept in his pay a number of writers for whom he dictated plots, and wished to number C. among his retainers; but C. was so audacious as to alter the plan of a comedy, and thus lost the cardinal's favour. He now returned to his native place, where M. Chalon, once secretary to Maria de' Medici, suggested that he should turn his attention to tragedy. As the English drama was not known, or at least not relished at that time beyond the limits of England, C. acquired the Spanish language that he might be enabled to study the Spanish drama, the only other of any consequence in Europe. The result was the *Cid* (1636), which was received with enthusiastic applause. Cardinal Richelieu alone seemed to find no merit in this drama, and induced the Academy to publish a critique in some respects unfavourable. In his next celebrated piece, *Horace* (1639), C. endeavoured to vindicate his claim to creative genius, which had been questioned by his enemies; but *Cinna* (1639) has been regarded by some French critics as C.'s master-piece, though others might be disposed to award this honour to *Polyeucte* (1640). In the *Mort de Pompée* (1641), though there is something dignified in the style, it occasionally passes into bombast. The comedy of *Le Menteur* (1642), partly taken from Pedro de Roxas, has natural truth and humour. C. now seems to have exhausted his resources, and his later pieces are almost all forgotten. Of his thirty-three dramas, only a few have kept their place on the French stage. Nevertheless, his countrymen call him *Le grand Corneille*, although Voltaire, who edited an edition of his works, and Laharpe have expressed themselves in some respects unfavourably regarding his genius. The faults of conception in several of his pieces were pointed out by the sharp criticism of Lessing. A. W. Schlegel also spoke in such a way as to provoke hot replies from the wounded pride of the French littérateurs. C.'s chief merit lies in his dignity of style, and in a certain declamatory grandeur of sentiment, which his countrymen have been accustomed to consider truly epical, and which it is now impossible to convince them as nearly resembles rant as it does sublimity. C. died October 1, 1684. The best edition of his complete works was edited by Renouard (12 vols., 1817).—C.'s brother, Thomas (born 1625—died 1709), also acquired a reputation as a dramatic writer.

**CO'RNEL**, or **CORNE'LIAN CHERRY** (*Cornus mas*), the *Cornus* of the ancients, a tree or shrub of 15—20 feet high, of the natural order *Cornaceæ*, a native of the middle and south of Europe, and of great part of Asia. It is not found wild in Britain, although it is common in shrubberies, and was formerly much cultivated as a fruit-tree, as it still is in Germany and other parts of Europe. It has oval leaves, and small yellow heads of flowers, which appear before the leaves in spring, and which abound in honey and are much frequented by bees. The fruit is oblong, a little larger than a sloe, shining, red, or rarely yellow or white. It is late in ripening, and until quite ripe is very austere; but when perfectly mellow, has an agreeable vinous acid taste: it is either eaten as it comes from the tree, or is made into a preserve, which is said to be tonic, and useful in diarrhœa. When gathered unripe, it is pickled like olives. It was formerly also fermented for a beverage. In Turkey, it is still much used in making sherbet. The wood of the C. is extremely hard and tough, and well adapted for those purposes of joiners and turners to which the size of the tree will admit of its application. It is used for making mathematical instruments.—Dwarf C. (*C. Suecica*),

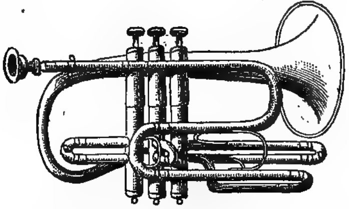


Cornel:
*a*, a branch with leaves and fruit; *b*, a single flower.

a native of mountain-pastures and bogs throughout the north of Europe and in Britain, is a plant about six inches high, with creeping root, sessile ovate leaves, each stem producing a single umbel of a few purple flowers, followed by small sweetish red fruit, which is tonic, and has the power of remarkably increasing the appetite, whence the plant has received a Gaelic name, signifying *Plant of Gluttony.*—Dogwood (q. v.) belongs to the same genus.

**CORNE'LIUS,** Peter Von, one of the first masters of the modern German school of painting, was born at Düsseldorf, 23d September 1787, and studied under Langer in the academy of his native town. When only 19 years of age, he painted some remarkable frescoes for the cupola of the old church of Neuss. Four years later, he gave still more unmistakable proofs of a creative fancy in his illustrations of Goethe's *Faust*, and the *Nibelungen Lied.* In 1811 he went to Rome. This journey exercised a profound influence on the whole of his future career. The great importance of the early masters became ever clearer to him as he studied their choicest productions. He gained a wide reputation, while at Rome, by two cartoons, 'Joseph's Interpretation of the Dream,' and Joseph's 'Recognition of his Brethren.' In 1819 he was called to Munich, and entered the service of the then crown-prince of Bavaria. Here he remained till 1841, and executed those grand works on which his fame mainly rests, and which may be divided into two classes, Pagan and Christian, the former of which comprises the large frescoes in the saloon of the Glyptothek, all illustrating stories of the Greek gods and heroes, as also representations of several Hesiodic myths, and of the various incidents of the Trojan war; while the latter, or Christian series, begun after the completion of the former in 1830, consists of frescoes on New Testament scenes, extending from the 'Incarnation' to the 'Judgment,' and decorate the 'Ludwig's Church' in Munich, which was built for the purpose of affording scope for the genius of Cornelius. The 'Judgment' is the largest fresco in the world, larger even than Michael Angelo's 'Judgment' in the Sixtine Gallery. In 1841, C. was invited by the king of Prussia to Berlin, where he was appointed director of the Berlin Academy. Among his productions in the Prussian capital are the frescoes in the Campo Santo, or royal burial-place. Opinion is divided regarding the merits of Cornelius. By his own countrymen he is extremely admired; French critics, on the other hand, regard him as more a thinker than an artist, sacrificing to his conception both truth of colour and expression. His works are said to require very often a commentary. He is admitted to be a philosopher, a poet, a profoundly creative genius, but *not* a painter. He has, however, formed a numerous school, from which have gone forth many illustrious pupils, among others Kaulbach.

**CORNELIUS NEPOS.** See Nepos.



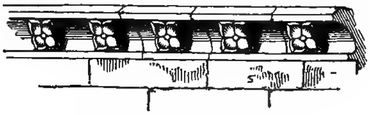
Cornet-a-piston.—Kœnig's Model.

**CO'RNET,** a stop, or series of pipes, in an organ, intended to imitate the tone of an obsolete wind-instrument which has been superseded by the oboe.—The Cornet-a-Piston, a modern wind-instrument of the trumpet kind, is generally made of brass, has two or three valves, and in brass bands takes the soprano and contralto parts. It was first introduced in France as an orchestral instrument. Its tones are less powerful, but far more easily manageable than those of the trumpet.

**CORNET** (Ital. *cornetta*, a small flag) is the lowest grade of commissioned-officer in the cavalry, equivalent to *ensign* in the infantry, his duty being to bear the standard. With the lieutenant, he assists the captain in the daily duties connected with the troop or company to which he belongs. There are as many cornets in a cavalry regiment as there are troops. A C.'s commission costs from £840 to £1260, according to the celebrity or (rather) the fashionable character of the corps. The pay is 8*s.* per day, with 1*s.* or 1*s.* 6*d.* extra for field-allowance. The half-pay varies from 2*s.* 6*d.* to 3*s.* 6*d.* The pay being utterly inconsistent with the price paid for the commission, and being, moreover, far below the probable daily expenditure, the obtaining of a cornetcy is looked forward to rather for the position it gives in society than as a means of support, or as an introduction to a real soldier's life.

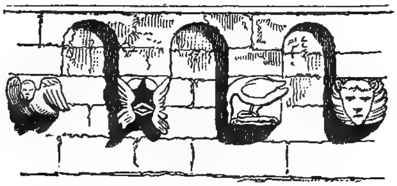
**CORNE'TO,** a town of Central Italy, about 12 miles north of Civita Vecchia, occupying a commanding eminence on the left bank of the Marta, and two or three miles from the Mediterranean, over which it has an extensive view. C. rose out of the ruins of the Etruscan city of *Tarquinii*, and is enriched by some of its monuments. It was erected into a city by Eugenius IV. in 1432; but the picturesque old battlemented walls and towers which surround it are said to belong to an earlier period. During the faction-wars of the Guelphs and Ghibelines, this city maintained a firm allegiance to the popes. Pop. 4000. The remains of Tarquinii (perhaps the most interesting in existence to the student of Etruscan history, as it is from the tombs here that most of our knowledge as to the games, costumes, and religious customs of this remarkable people has been derived) lie about a mile and a half from Corneto. The Necropolis of Tarquinii covered 16 square miles, and it has been estimated on high authority that it could not have contained less than 2,000,000 tombs. Of this vast number, some 2000 have been opened within recent years. Among the most noteworthy of these are the Grotta delle Iscrizioni, the Grotta delle Bighe, Grotta del Barone, Grotta Francesca, Grotta del Cardinale, Grotta del Triclinio, and Grotta della Querciola. Treasures from this mine of Etruscan wealth, as it may be called, enrich the British Museum, and other important collections in Britain and on the continent.

**CO'RNICE.** In classical architecture, the C. is the uppermost member of the entablature, surmounting the frieze. Each of the orders has its peculiar C.; but these, with their relation to the other portions of the entablature, will be better understood when explained in conjunction with that term. See Entablature. In the Gothic



Cornice:
Ensham Church, Oxon, circa 1450.

styles, the form of the C. varies greatly. 'In the Norman style,' says Parker, 'a plain face of parapet, slightly projecting from the wall, is frequently used as a C., and a row of blocks is often placed under it, sometimes plain, sometimes moulded or carved into heads and other ornaments, when it is called a corbel table.' These blocks have commonly a range of small arches over them. In some cases a small plain string is used as a cornice. The corbel table continued to be used as a C. in the Early English style; but it was generally more ornamented than in the Norman, the arches being commonly trefoils and well moulded. The blocks are frequently ornamented with a head, or other figure characteristic of the style. Sometimes a range of horizontal mouldings is placed above the arches of the corbel table, and sometimes the C. consists of simple mouldings, without any corbel table. In the other styles, the C. is also very irregular, sometimes having a deep sunk hollow richly ornamented.



Corbel Table.

The term C. is also used, in a general sense, to signify any horizontal moulded projection, terminating a building, or the component parts of a building. It is in this sense that we speak of the C. of a room.

**CO'RNO MO'NTÉ**, or **GRAN SA'SSO D'ITA'LIA**, a mountain in Southern Italy, the culminating peak of the Apennines, in lat. 42° 27′ N., long. 13° 38′ E. It has an elevation of upwards of 10,000 feet.

**CORNS** are small hard growths, resulting from an increase in the thickness of the cuticle or epidermis, which is generally caused by the irritation of some excessive pressure or friction on the part. They occur most commonly on the toes as a result of tight shoes. Three varieties of C. are described, viz.—1. *Laminated Corns* or *Callosities*, in which the hardened cuticle is arranged in layers, frequently of a dark-brown colour, from the effusion of blood in the deeper layers. 2. *Fibrous Corns* (clavi), which are not only fibrous in their early stages, but, as time goes on, sink into the skin, sometimes producing great pain. Frequently, a bursa, or small bag, is formed beneath, to protect the tender subjacent tissues, and if this bursa should inflame, matter speedily forms, and the pain and constitutional irritation become severe; at other times, the pressure may cause absorption of the ends of bones, and serious alterations in the condition of a joint. The duty of the chiropodist is to dislodge the imbedded peg of hard cuticle from its socket. Should he cut it across, the fibrous arrangement will present the appearance of 'roots,' a popular delusion of great value to itinerant corn-doctors. 3. *Soft C.* occur between the toes, and cause much annoyance; they are generally small, and being constantly bathed in perspiration, the cuticle does not harden, as in the other varieties. They sometimes give rise to painful ulcerations.

*The treatment of C.* consists in the removal of all undue pressure or friction, either by removing the shoe altogether, or protecting the corn by surrounding it with a border of some soft material, as Amadou (q. v.) or soft leather: or the hardened cuticle may be softened by the application of some alkaline lotion, and then scraped or filed away: or it may be extracted, as before mentioned. A lotion of soda or potash is often found very useful. The cuticle composing a soft corn should be clipped off with scissors, and a small piece of cotton-wool be placed between the toes. In all serious cases, application should be made to a respectable chiropodist.

C. affect horses as well as men. In the foot of the horse they occur in the angle between the bars and outer crust, and consist in a bruise of the sensitive secreting sole. Two forms of feet are especially subject to them—those with deep narrow slanting heels, in which the sensitive sole becomes squeezed between the doubled up crust and the shoe; and wide flat feet which, by the senseless cutting away of the bars and outer crust, allow the delicate interior parts to be pressed with all the force of the animal's weight on the unyielding iron shoe. Serum and blood are poured out, whilst the secreting parts being weak and irritable, produce a soft, scaly, unhealthy horn. C. constitute unsoundness; cause a short, careful, tripping gait; are the most frequent source of lameness amongst roadsters; abound in badly-shod horses, especially those with the kind of feet alluded to; and usually occur in the inside heels of the forefeet, these being more especially subjected to weight, and hence to pressure. The discoloured spot indicating the recent corn must be carefully cut into with a fine drawing-knife; any serum or blood is thus allowed free vent. If the bruise has been extensive, a poultice will have the twofold effect of allaying irritation, and relieving the sensitive parts by softening the hard unyielding horn. When the injury has been of some standing, and soft faulty horn is secreted, a drop of diluted nitric acid may be applied. On no account must the bars or outer crust be removed; they are required for bearing weight, which may be further kept off the injured part by the use of a bar-shoe. In horses subject to C., keep the feet soft by dressing with tar and oil or any suitable emollient; pare out the C. every fortnight; use a shoe with a wide web on the inside quarter, and nailed only on the outside; and, if the sole is thin and weak, employ leather pads.

**CO'RNSTONE**, a peculiar—often mottled—limestone of the Old Red Sandstone formation of Herefordshire, Shropshire, and South Wales.

**CO'RNU AMMO'NIS.** See AMMONITES.

**CORNUCO'PIA** (Lat. *cornu*, a horn, and *copia*, plenty). The horn of plenty—regarding the origin of which several fables are told by the ancient poets—is generally placed in the hands of emblematical figures of Plenty, Liberality, &c., who are represented as pouring from it an abundance of fruits, corn, &c. It is frequently used both in architecture and heraldry. On the arms of banks, and other public institutions, it is often represented pouring forth coins.

**CO'RNWALL**, a maritime county, forming the south-west extremity of England, and the southmost county in the British Isles. It is a peninsular right-angled strip of land, with the apex in the south-west, and is bounded on the E. by Devonshire, with the Tamar between, on the N. and W. by the Atlantic, and on the S. by the English Channel. From its Devonshire boundary it runs south-west, narrowing to the Land's End, the westmost part of England, in 5° 41′ 31″ W., it then bends north to Penzance, whence it sweeps round in a south-eastern direction to the Lizard Point, the southmost part of England, in 49° 57′ 30″ S. From thence it follows a north-eastern course to Plymouth

Sound. Greatest length in a straight line from Welcomb to the Land's End, 81 miles; extreme breadth from Welcomb to Rame Head, 46 miles. Area, 1365 sq. miles, of which seven-eighths are arable, meadow, or pasture. The surface is irregular, with rapid ascents and descents. A ridge of rugged, bleak, moory hills, rising to the height of from 800 to 1300 feet, run south-west through the centre of Cornwall. From this ridge the country slopes, and the streams flow on each side. The hill valleys are longer and wider on the south than on the north side of this ridge, and some of them are picturesque with corn, wood, orchards, rivulets, and meadows. The coasts are bold and rocky, and indented with many headlands and bays. The chief indentations are Plymouth Harbour, Falmouth Harbour, one of the finest in Britain, and Mount's Bay between Lizard Point and Land's End. Twenty-four miles off the latter point are the Scilly Isles. On the north-west coast occur shifting sands, often in hills several hundred feet high. The chief rivers are the Tamar, which runs 59 miles along the east border, 19 miles being a tidal estuary, ending in the noble roadstead of Plymouth Sound; the Fal, which runs 20 miles south, 10 miles being tidal, and ends in the fine harbour of Carrick Road, near Falmouth; and the Allan or Camel, 29 miles long, 8 being navigable. Woods, meadows, arable land, and 140 parish churches, are said to have been submerged between Mount's Bay and the Scilly Isles. Old red sandstone, the 'killas' of the miner, covers above three-fourths of C., and is intersected by three large masses of granite in the interior of the county, with one around Land's End, and by porphyry veins and dikes, some being 50 or 80 fathoms thick, and also by limestone beds. The granite on the hills is often worn by the weather into the form of prismatic, cubical, or spheroidal blocks, piled in gigantic cairns. These blocks sometimes form Logging or Logan Stones. Copper and tin veins, generally 1 to 3 feet thick, but varying from the thickness of paper to 30 feet, and of unknown depth, run through the granite and sandstone, generally from east to west. Tin also occurs in the gravel; and lead, silver, cobalt, and antimony veins in the sandstone. Lizard Point consists of mica-slate, with soapstone veins, and chinastone; and the country around, of serpentine, hornblende, and diallage rocks. Chinastone, or decomposed felspar of granite, is found near Launceston, and is a chief ingredient in retorts and crucibles made at the Staffordshire potteries. In 1856, C. had 135 copper, 144 tin, and 42 lead mines. C. yields one-third of the copper and nine-tenths of the tin raised in the British Isles. The great mining district extends from Dartmoor, in Devon, to Land's End, the veins and lodes, or fissures, chiefly occurring in granite, or killas. Nearly all the ores of C. are smelted in South Wales.

The climate is mild, especially in winter, but damp, with almost daily rain. Snow rarely lies above a few days. South-west winds prevail for nine months in the year, and furious gales are frequent. Some plants of the south of Europe, as the myrtle, tamarisk, and balm of Gilead, flourish in the open air; but fruits do not ripen well. The soil is light, gravelly, or slaty. The land is generally barren in the mining tracts, but fruitful in the valleys and on the coast. The chief crops are barley, wheat, oats, and potatoes; but harvest is generally later than in the inland counties. Near Penzance, however, two crops of potatoes are got yearly. C. is far more a mining than an agricultural county. The pilchard-fishery is very profitable, and employs a large number of people from July to September. The only exports are mining produce and fish. Landed property is much divided. The census of 1851 gave a population of 355,558; C. had then 1074 day-schools, with 38,604 scholars; 1104 churches, 265 belonging to the Church of England, the rest to dissenters, chiefly Wesleyans. 30,000 persons are employed in the mines. The county returns 2 members to parliament. C. has ancient British antiquities, such as rude upright stone blocks, single and in lines, circles, barrows, and cromlechs. Many Roman coins, &c., have been found. There are many Saxon camps and earthworks. C. and the Scilly Isles were the Cassiterides, or tin isles of the Phœnicians and Greeks. Vortigern made C. a kingdom in 446 A.D. The West Saxon kings subdued it in 650. The Saxons and Danes overran it in the 9th and 10th centuries. C. has remains of ancient castles and monasteries. It was erected into a duchy in 1329, in favour of the Black Prince, eldest son of Edward III., who, with the succeeding Princes of Wales, had immense revenues from the county. The dukedom is still held by the Prince of Wales, who has an exchequer court and a revenue of £30,000 from land, and appoints the sheriffs. The Cornish tongue, a Celtic dialect, became extinct only in the present century.

**CORNWA'LLIS**, CHARLES, MARQUIS, an English general and statesman, son of the first Earl Cornwallis, was born December 31, 1738, and was educated at Eton and Cambridge. He served as aide-de-camp to the Marquis of Granby in the Seven Years' War; in 1776 was made a colonel, and four years later, governor of the Tower of London. Though personally opposed to the war in America, he accompanied his regiment thither, and with an inferior force gained victories over General Gates at Camden in August 1780, and over General Greene at Guilford, March 1781. In the same year, however, he was forced to surrender with all his troops at York Town, Virginia. This disaster proved the ruin of the British cause in America, and was the occasion of much dissatisfaction, resulting in a change of ministers at home. C., however, who was high in favour with the king, escaped censure. In 1786, C. was appointed governor-general of India and commander-in-chief, and in this double capacity distinguished himself by his victories over Tippoo Saib, and by his unwearying efforts to promote the welfare of the natives. His measures, however, were far from answering the purposes he intended. He returned from India in 1793, when he was raised to the rank of Marquis. Appointed lord-lieutenant of Ireland in 1798 during the time of the Rebellion, he succeeded in putting it down, and in establishing order in a manner that gained him the good-will of the Irish people. As plenipotentiary to France, he negotiated the peace of Amiens. Reappointed governor-general of India in 1804, he died at Ghazipore, in the province of Benares, in October of the following year, on his way to assume the command of the army in the Upper Provinces. As a statesman or warrior, C.'s talents did not rise much above respectable mediocrity, but he was upright, diligent, and humane in a more than ordinary degree.

**CORO'LLA**, in Botany, the inner floral envelope of the greater number of phanerogamous plants; the second of those whorls of modified leaves which form the flower (q. v.). It is in the C. that fine colours and the greatest delicacy and beauty of the flower are in general chiefly displayed. The modified leaves of which it is composed are called *petals*, and are very various in form and number. They are also in very many plants united into a tube at the base, when the C. is said to be *monopetalous;* and this union often extends through their whole length, leaving their number to be discerned merely in the teeth in which the C. (bell-shaped, funnel-shaped, tubular, &c.) terminates. The petals of a flower are either similar, when the C. is said to be *regular*, or they differ in form, often very widely, when it is called *irregular*. They not unfrequently assume remarkable and even grotesque forms. Many petals have appendages of various kinds, as *scales, nectaries, spurs, coronæ* or *crowns*, &c. Petals often consist of a *limb*, or expanded portion, and a *claw*, the narrower part, which is covered by the calyx, and by which the petal is attached, but some times the claw is wanting or obsolete, sometimes it is united with the tube of the calyx, so that the petals appear to rise out of the calyx. See Calyx and Perianth.

**CO'ROLLARY**, a proposition the truth of which appears so clearly from the proof of another proposition as not to require separate demonstration.

**COROMA'NDEL COAST**, often vaguely taken as the whole of the west shore of the Bay of Bengal, extends, in its proper acceptation, from Point Cashmere, in lat. 10° 17′ N., long. 79° 56′ E., to Gondegam, in lat. 15° 20′ N., long. 80° 10° E. It is pretty nearly co-extensive with the districts of Tanjore, Arcot, Chingleput, and Nellore, comprising, along with Madras and Pondicherry, the grand battle-field of last century between England and France in India. With various estuaries and inlets, it is yet commercially of very little value, not presenting a single safe place of refuge for large vessels. So shallow, moreover, is the water for a considerable distance from the land, that ships of any size are obliged to lie several miles off; while the intermediate space, or at least that belt of it that is nearest the beach, presents a surf in which no ordinary boat can live—the only safe craft being the native catamaran (q. v.).

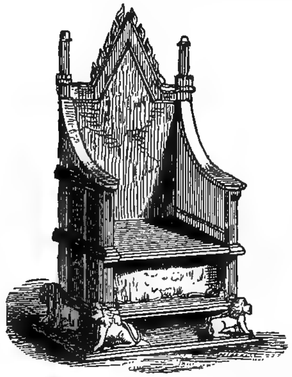
**CORO'NA**, or **CROWN**, in Botany, an appendage of the corolla in some flowers; sometimes assuming the appearance of an interior corolla very different from the true corolla, and either divided into parts resembling petals, or consisting only of one piece, and surrounding the organs of fructification like a monopetalous corolla; sometimes assuming very peculiar forms. It is often difficult to determine whether the C. is properly to be regarded as belonging to the row of petals, or to that of stamens. The C. was included by Linnæus under the very comprehensive term nectary. A familiar example may be seen in *Narcissus;* forms very different may be seen in *Stapelia*, and other genera of the natural order *Asclepiadaceæ*.

**CORONA** (Lat. a crown), in Architecture, the drip, or lower member of the projecting part of a classical cornice. See Entablature. The term C. is also applied to the apse or semicircular termination of the choir, especially by ecclesiastical writers. Hence we hear of 'Becket's crown,' at Canterbury. C. is also applied in ecclesiastical nomenclature, to a chandelier, in the form of a crown or circlet, suspended from the roof of a church, or from the vaulting of the nave or chapels, to hold tapers which are lighted on solemn occasions.

*a*, the Corona.

**CORONA BORĔA'LIS**, a small and bright constellation near Hercules.

**CORONA'TION.** The use of crowns in antiquity, as a mark either of honour or of rejoicing, will be explained under Crown. It was, no doubt, as an adaptation of this general custom to a special use that the practice of placing a crown on the head of a monarch at the commencement of his reign was introduced. The practice is very ancient, as we may learn from the fact that Solomon and Ahaziah were crowned; and there is probably scarcely any country in which it has not been followed in one form or another. Generally it has been accompanied by what was regarded as the still more solemn rite of anointing with oil, a ceremony which, from the times of the ancient Hebrews to our own, has been peculiarly significant of consecration or devotion to the service of God. The term employed for C. in the Saxon chronicle, 'gehalgod,' is hallowed or consecrated; and it would seem that the ceremony as then performed at Kingston-on-Thames or Winchester, was in all essentials the same as that which now takes place in Westminster Abbey. A copy of the Gospels is still in existence amongst the Cottonian MSS. in the British Museum, which is believed to be the identical copy on which the Saxon kings were sworn. Detailed accounts of many English coronations, from Richard I. downwards, have been preserved. They will be found enumerated, along with those of the German emperors, the kings of France, emperors of Russia, &c., in Bohn's *Cyclopædia of Political Knowledge;* and much more fully, along with much interesting information on the subject generally, in *Chapters on Coronations* (Lond. 1838).



Coronation Chair of the Kings of England, kept in Westminster Abbey:
Beneath the seat is the 'Stone of Destiny,' carried off from Scone by Edward I. in 1296.

**CORONATION GULF**, an inlet of the Arctic Ocean, forms the south-east part of the landlocked and isle-studded bay that receives the Coppermine. Lat. 66° 30′—68° 30′ N., long. 109°—110° W.

**CORONATION OATH.** The form in which the limitations imposed on the monarch were defined by the nation and accepted by him, was probably from the first something equivalent to a coronation oath. Up to the period of the revolution, however, the C. O., like all the other guarantees for popular liberty, admitted of being tampered with; and there is in existence (Cottonian MS., Tib. E. viii.) a copy of the oath sworn by Henry VIII., interlined and altered with his own hand.

To obviate the possibility of such proceedings for the future, the existing C. O., altered only in consequence of the subsequent unions between England and Scotland, and Great Britain and Ireland, was fixed by stat. 1 Will. and Mary, st. 1, c. 6. It is to the following effect, and thus administered. The

Archbishop of Canterbury demands of the king (or queen): 'Sir (or Madam), is your Majesty willing to take the oath?' and on the king answering, 'I am willing,' the archbishop ministereth these questions; and the king, having a copy of the printed Form and Order of the Coronation Service in his hands, answers each question severally, as follows:

*Archb.* Will you solemnly promise and swear to govern the people of this United Kingdom of Great Britain and Ireland, and the dominions thereto belonging, according to the statutes in parliament agreed on, and the respective laws and customs of the same?

*King.* I solemnly promise so to do.

*Archb.* Will you, to your power, cause law and justice, in mercy, to be executed in all your judgments?

*King.* I will.

*Archb.* Will you, to the utmost of your power, maintain the laws of God, the true profession of the Gospel, and the Protestant reformed religion, established by law? And will you maintain and preserve inviolably the settlement of the United Church of England and Ireland, and the doctrine, worship, discipline, and government thereof, as by law established within England and Ireland, and the territories thereunto belonging? And will you preserve to the bishops and clergy of England and Ireland, and to the churches there committed to their charge, all such rights and privileges as do, or shall appertain unto them, or any of them?

*King.* All this I promise to do.

The sovereign then goes to the altar, and, laying his hand upon the Gospels, takes the following oath: 'The things which I have heretofore promised, I will perform and keep, so help me God.'

The sovereign then kisses the book, and signs the oath.

The passage in the oath in which the sovereign guarantees the privileges of the Church of England, is framed in conformity with the 'Act for Securing the Church of England as by Law Established,' which is declared to be a fundamental and essential part of the Treaty of Union, and which was inserted accordingly in the act by which the Treaty of Union was finally ratified. The passage in the act which provides for the security of the Church of Scotland was framed in conformity with an 'Overture for an act for security of the Church'—of which a copy will be found in the Appendix to Defoe's *History of the Union*, p. 617. It is to the effect that, 'after the decease of her present Majesty (whom God long preserve), the sovereign succeeding to her in the royal government of this kingdom shall, in all time coming (not at the coronation), *at his or her accession to the crown, swear and subscribe* that they shall maintain and preserve the foresaid settlement of the true Protestant religion, with the government, worship, and discipline of this Church, as above (that is, by the previously recited act, 1 Will. and Mary, c. 5) established, inviolably.' The security of the Church of Scotland is thus provided for, by what may be called an accession oath, even during the period which must intervene between the accession of the sovereign and his coronation, when he is not bound, by oath at least, to the maintenance of the other branches of the constitution.

**CORONE'LLA**, a genus of non-venomous serpents of the family *Colubridæ*, of a small size, having a somewhat compressed and generally pentagonal body, and rather long conical tail. They inhabit the warm and temperate parts of the world. One species, *C. lævis*, is found in the centre and south of Europe.

**CO'RONER** (Lat. *coronator*, *corona*, a crown), a very ancient officer, in England, at the common law. He is mentioned in a charter of King Athelstan, 905 A. D.; and the office, like much of the common law, is acknowledged to be of Saxon origin. The name is derived from the fact, that the C. has chiefly to do with pleas of the crown. In this light, the Lord Chief-Justice of the Queen's Bench is the principal C. in the kingdom, and may exercise jurisdiction in that capacity in any part of England. There are, however, particular coroners for every county of England, and in some counties, three or four, or even more. They were formerly paid by fees on each inquest, but now (23 and 24 Vict. c. 116) by salary paid out of the county rate. The C. is chosen for life, and the election rests with the freeholders of the county or district. A C. may, however, be dismissed by the Lord Chancellor for inability or misbehaviour in his office. By the statute of Westminster the first (3 Edw. I. c. 10), it was enacted that none should be chosen but lawful and discreet knights; and in the time of Edward III., there is an instance of a man being removed from the office because he was merely a merchant. Subsequently, it was thought sufficient if a man had lands enough to entitle him to be made a knight; and Blackstone complains that in his time it had come to be sought for the perquisites, and not for the honour of serving the country. This, no doubt, is in general the case. The C. is now usually a professional man, frequently an attorney or a medical man.

The office of C. is remarkable as being the only one in England charged with the investigation of crime. Where the C. cannot act, there is no authority to examine witnesses until a suspected person has been actually arrested and brought before a magistrate. But even the C.'s duties are very limited, being regulated to this day by the statute 4 Edw. I. The C. can inquire only into the causes of violent or sudden death, and into these only when the body has been found. When such a death happens, it is the duty of the township to give notice of it to the C., who then summons a jury from the neighbouring townships for the purpose of making an inquisition into the matter. The C. presides over the inquisition, and the court thus constituted is a court of record. The jury consists of twelve men, who are sworn and charged by the C.; and the verdict must be unanimous. By 6 and 7 Vict. c. 12, it has been enacted that the inquest shall be held before the C. in whose district the body shall be 'lying dead.' If any be found guilty by such inquisition of murder or other homicide, the C. is to commit them to prison for further trial, and is also to inquire concerning their lands, goods, and chattels, which are forfeited thereby; and he must, moreover, certify the whole of this inquisition under his own seal and the seals of the jurors, together with the evidence thereon, to the Court of Queen's Bench or the next assizes. The accused may thereupon be put on his trial without other indictment. By 6 and 7 Will. IV. c. 89, the C. is empowered to summon, and by 1 Vict. c. 68 to pay, medical witnesses, in place of referring them for payment to the church-wardens. The sums allowed are one guinea for a simple examination, and two guineas if a *post-mortem* examination of the body has been made. By 6 and 7 Vict. c. 83, coroners are empowered to appoint deputies in case of absence from illness or other reasonable cause. 9 and 10 Vict. c. 37 regulates the duties of the C. and the expenses of inquests in Ireland. Another branch of the C.'s office is to inquire concerning shipwrecks and treasure-trove; but this has been nearly superseded by the provisions of the Merchant Shipping Act, 1854. He is a conservator of the king's peace, in which capacity he is mentioned in one of the oldest treatises on the common law (*Mirror*, c. 1, s. 3). As such, he may cause felons to be apprehended, whether an inquisition has found them guilty or not. The C. has likewise ministerial functions as the sheriff's substitute, in executing process in suits in which the sheriff is related either to the plaintiff or defendant. Latterly, the office of C. has been the subject of consideration, with a view to certain reforms of administration. In many cases, it is alleged that the C. makes a job of his office, trumps up cases, and acts vexatiously at variance with the warrants of magistrates. Coroners or crowners, as they were also called in England, are mentioned in many old Scottish statutes; and there is no doubt that the office, as well as that of alderman and mayor, existed in those parts of the country that were peopled by persons of Teutonic race. But it was abolished or fell into desuetude, probably in consequence of the succession war and the French connection; and in Scotland the duties are now chiefly performed by an officer appointed by the crown, styled the Procurator-fiscal (q. v.).

**CO'RONET.** See CROWN.

**CO'RPORAL** (more properly *Caporal*, from the Italian *capo di escadra*) is, so far as concerns the British army at the present day, the lowest of the non-commissioned officers. Formerly, the post was of more importance. In the time of Queen Elizabeth there was a C. of the Field, a sort of brigade-major; and the other corporals were chiefs over a considerable number of men. At the present time, the British army contains about 6000 corporals, receiving pay varying from 1*s*. 4*d*. to 2*s*. 6*d*. per day. The lance-C. is an assistant C., who remains, however, on private's pay; he wears one *chevron* (q. v.) on his arm, and two when he rises to the rank of corporal.

On shipboard, there is a naval C., a petty-officer under the master-at-arms; to aid in teaching the seamen the use of small-arms, to guard against the smuggling of spirits on board, to extinguish the fires and lights at a given signal, and to keep order below at night.

**CORPORAL** (Lat. *corpus*, a body, because of the belief that the bread and wine are the body and blood of our Saviour), a name given to the cloth with which the minister covers what is left of the consecrated elements in the Lord's Supper until the service is concluded. It is also called the *Pall*, and its use is of the highest antiquity.

**CORPORAL PUNISHMENTS.** See FLOGGING.

**CORPORA'TION.** This, in England, is either aggregate or sole. A C. aggregate is a society of persons authorised by law to act as one person, and to perpetuate its existence by the admission of new members. Without such legal authority, the acts of the society would be regarded only as the acts of the individuals, and the property of the society would descend to the heirs of the individual members. A C. sole consists of one person, and his successors, who are by law invested with the same capacities as a C. aggregate. The sovereign is a C. sole, and so is a bishop and the vicar of a parish, for these in the eye of the law never die, and each successive holder of the office takes the property belonging to it, neither by conveyance nor by ordinary succession, but is vested in it by his mere holding of the office.

A C. could formerly be established only by charter from the crown or act of parliament, unless, indeed, it existed by immemorial prescription; but of late years the exigencies of commerce have led to the passing of various enactments, by compliance with which any society of persons may acquire for themselves the character of a corporation. The particulars of these will be considered under the title JOINT-STOCK COMPANIES. A C. always receives a corporate name, by which it sues and is sued, and it must possess a common seal, the affixing of which is the only competent way of affixing the signature of the corporation. The majority of the members of a C. are entitled to act in its name, and may, by a by-law, even delegate—except in the case of municipal corporations—the power of acting in its name to a certain number of its members. For the acts of the C., none of its members are personally liable. A C. may hold lands—subject to the statutes of Mortmain (q. v.)—and may be possessed, if a C. aggregate, of chattels; but a C. sole has not this privilege, unless it be the representative of a number of persons for whose benefit the chattels are held. But no C. can be either a trustee-proper or an executor.

Corporations, whether aggregate or sole, are divided into ecclesiastical and lay, and the lay are subdivided into civil and eleemosynary. The ecclesiastical are such as are composed wholly of clergymen, in their ecclesiastical capacity, and are chiefly for the purpose of holding ecclesiastical property. Civil corporations include municipal corporations, the universities, the colleges of physicians and surgeons, learned societies, and many trading companies incorporated. Eleemosynary corporations are for the administration of funds for charitable and pious purposes, such as hospitals, the colleges in universities, &c. An important consequence of these distinctions, is the effect it has on the right of *visiting* a C., or exercising a legal superintendence over its proceedings. The crown is the visitor of the archbishops, each archbishop is the visitor of his suffragan bishops, and each bishop is the visitor of all the ecclesiastical corporations in his diocese. Civil corporations have no visitor, but the Court of Queen's Bench is the authority entitled to restrain and direct them. Eleemosynary corporations are visited by the founder and his heirs, or such persons as the founder appointed to be visitors; and in default of such persons, or of the founder's heirs, the Court of Chancery acts as visitor. Hospitals, if of ecclesiastical nature, are, however, subject to the visitation of the bishop.

A C. may be dissolved by the death of all its members, or of such number as leaves not enough to make new elections in the way the charter requires; by forfeiture of the charter, through breach of its conditions; by surrender of the charter; or by act of parliament. In all such cases, the lands of the C. revert to their several donors, and the debts due by or to the C. are extinguished.

Municipal corporations, formerly dependent on special charter alone, are now made uniform, and regulated by the 5 and 6 Will. IV. c. 76, and some subsequent acts. See MUNICIPAL CORPORATIONS.

As to public corporations in Scotland, see BURGH, TOWN COUNCIL, FRIENDLY SOCIETY; and as to private corporations for trading purposes, see BANK, LIABILITY (limited), PARTNERSHIP.

**CORPS D'ARMÉE**, in the military system of the greater continental European states, is an organisation of the forces in the time of peace. The whole military strength is divided into several corps, each complete in itself as an army, with everything needful for service, staff and artillery park included. The English army is too small to be divided into corps. In the French system, a military force exceeding 100,000 men is regarded as being too large for one army, and is therefore divided into two or more corps. The immense military force of Russia is divided into ten or twelve distinct corps, which, in times of peace, are quartered in widely distant provinces of the empire. Austria, in like manner, maintains many corps in her several states or governments.

**CO'RPSE-CANDLE.** See CANDLE.

**CO'RPUS CHRI'STI, or BENE'T CO'LLEGE,** Cambridge, was founded by two guilds or fraternities of townspeople—the guild of Corpus Christi, who had their prayers at St Benedict Church; and the guild of the Blessed Virgin, who prayed at St Mary's. These were united in 1352, and a small college erected by them. Archbishop Parker added largely to the endowments of this college, and bequeathed to it his valuable manuscripts, amongst which are the only authentic manuscript copies of the Thirty-nine Articles of the Church of England. There are 12 fellows, all of whom must take holy orders. There are numerous scholarships, some of considerable value, given to the students who most distinguish themselves at the annual examinations. Among the eminent men of this college were Hugh Latimer, Archbishops Parker and Tennison, Fletcher the dramatist, and Gough the antiquary.

**CORPUS CHRISTI,** Oxford. This college was founded in 1506 by Richard Fox, Bishop of Winchester, under a licence from King Henry VIII. The statutes were issued in 1517. The foundation consisted of 20 fellows and 20 scholars; of whom the fellows were to be elected from the scholars, while the scholars were to be elected from certain specified counties. Two peculiarities marked this foundation. First, the usual rules of life and discipline were enforced with peculiar severity; and, second, the object of the college was expressly connected with the studies of the age. Classical literature was for the first time distinctly mentioned. The subjects of the lectures were enjoined to be, not the old routine of divinity and the two philosophies, but divinity, humanity, and Greek. Incessant industry in these pursuits was inculcated by the founder, and the fellows were even forbidden to accept the proctorship, lest the avocations of that office should interfere with their proper duties. The object and the stringency of these regulations called forth the celebrated encomium of Erasmus, that what Colossus was to Rhodes, what the Mausoleum was to Caria, that C. C. College would be to the kingdom of Great Britain. This prediction has hardly been fulfilled. The rules of the founder have been gradually set aside by acts of parliament, by custom, and by injunctions of the visitor. Of the three university lectureships contemplated by the founder, one was never founded at all, and the other two were merged in the college fellowships and tutorships. And, lastly, the college has suffered greatly from the severe restrictions imposed by statute upon the elections to fellowships. In virtue of the powers conferred by 17 and 18 Vict. c. 81, important changes have been effected by the college working in harmony with the commissioners. Both fellows and scholars are now elected without any restrictions as to place of birth. The fellowships are still 20 in number, value rather more than £200 a year. The intentions of the founder regarding university lectureships are now carried out by the professor of Latin being admitted an honorary fellow of Corpus, and receiving from its revenues a total sum of £600 a year. The scholarships are also 20 in number, tenable for five years, and of the annual value of £80; besides four exhibitions of the same value, and tenable for the same period. The election of fellows and scholars takes place in the week preceding Palm Sunday in each year. There are 22 benefices in the gift of this college; and in the year 1860 there were about 160 names on the college books.

**CORPUS CHRISTI FE'STIVAL,** the most splendid festival of the Roman Catholic Church. It was instituted in 1264, in honour of the Consecrated Host, and with a view to its adoration, by Pope Urban IV., who appointed for its celebration the Thursday after the festival of the Trinity, and promised to all the penitent who took part in it, indulgence for a period of from forty to one hundred days. The festival is chiefly distinguished by magnificent processions. In France, it is known as the *Fête Dieu.*

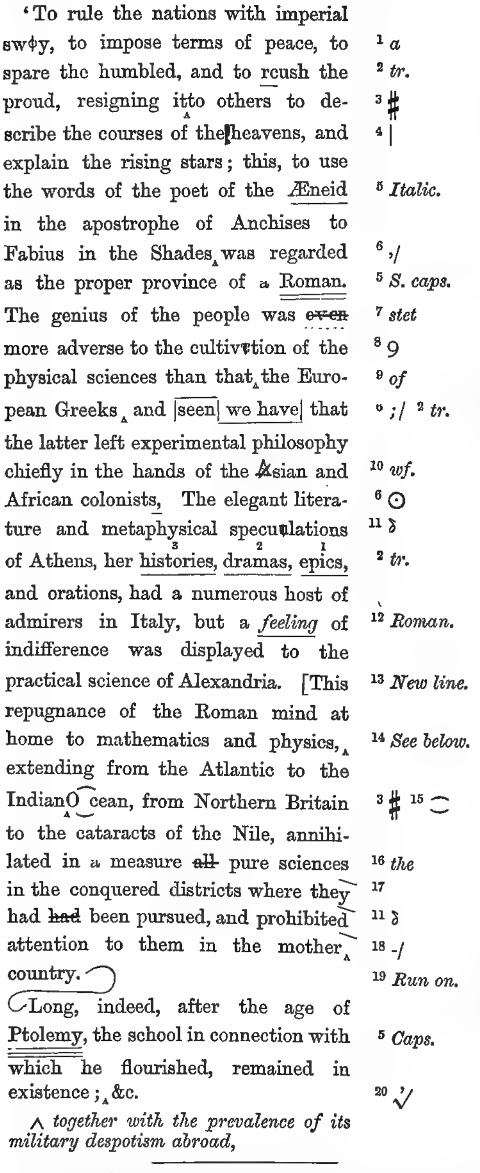
**CORPUS DELI'CTI,** a criminal law term used in Scotland to signify the body or substance of the charge. Before a conviction can take place, the fact libelled must be proved—e. g., before a man can be convicted of murder, it must be clearly made out that there was a murder; and it is this fact that is called the corpus delicti. See CRIMINAL LAW.

**CO'RPUSCLES, BLOOD.** See BLOOD.

**CORRE'CTION, HOUSE OF,** a prison for the reformation of petty offenders. See PRISON, REFORMATORY.

**CORRECTION OF THE PRESS.** This is one of the most important of the many operations that every piece of printed matter must undergo before it is put into the hands of the reading public; and in every considerable printing establishment, it forms a special department executed by one or more functionaries, technically called 'Readers.' The immediate object of a corrector of the press, or 'reader,' is to observe and mark every error and oversight of the compositor, with a view to make the printed sheet a perfect copy of the author's manuscript. This is on the supposition that the manuscript itself is quite correct, which is seldom the case; and therefore the duty of a good reader extends to seeing that there are no inconsistencies in orthography, punctuation, abbreviations, &c., and in many cases to the verification of quotations, dates, and proper names. The duty of securing consistency in spelling and punctuation is especially important in the case of works on which several writers are employed, such as newspapers and cyclopædias. The corrector has also to direct his attention to the numbering of the pages; to the arrangement of chapters, paragraphs, and notes; to running titles, &c. It is part of his business to observe the mechanical defects of the work—defective types, turned letters, inequalities of spacing between words, sentences, and lines, crooked lines, and to secure symmetry in verses, tables, mathematical operations, and such like. In almost all cases, two proofs are taken, and in difficult works, such as those in foreign languages, tables, &c., even more. Lastly follows the revision, in which little more is done than seeing that the compositor has made all the corrections marked on the last proof. It is usual for the writer or author to reserve the correction of the second proof for himself.

In printing regular volumes, one sheet is usually corrected at a time; but where extensive alterations, omissions, or additions are likely to be made by writer or editor, it is more convenient to take the proofs on long slips, before division into pages. The corrections to be made are marked on the margin; and for this purpose an established set of signs or short-hand is used, understood by all printers, and which it is often useful to know. The following specimen of a proof exhibits the application of most of these signs:



‘To rule the nations with imperial
swφy, to impose terms of peace, to  1 a
spare the humbled, and to rcush the  2 tr.
proud, resigning itto others to de-  3 #
scribe the courses of the heavens, and  4 |
explain the rising stars; this, to use
the words of the poet of the Æneid  5 *Italic.*
in the apostrophe of Anchises to
Fabius in the Shades‸was regarded  6 ,/
as the proper province of a Roman.  5 *S. caps.*
The genius of the people was ~~even~~  7 *stet*
more adverse to the cultivtion of the  8 9
physical sciences than that‸the Euro-  9 *of*
pean Greeks‸ and |seen| we have| that  6 ;/  2 *tr.*
the latter left experimental philosophy
chiefly in the hands of the Asian and  10 *wf.*
African colonists, The elegant litera-  6 ⊙
ture and metaphysical specuulations  11 ẟ
of Athens, her histories, dramas, epics,  2 *tr.*
and orations, had a numerous host of
admirers in Italy, but a *feeling* of  12 *Roman.*
indifference was displayed to the
practical science of Alexandria. [This  13 *New line.*
repugnance of the Roman mind at
home to mathematics and physics,‸  14 *See below.*
extending from the Atlantic to the
Indian‸O cean, from Northern Britain  3 #  15 ⁀
to the cataracts of the Nile, annihi-
lated in a measure ~~all~~ pure sciences  16 *the*
in the conquered districts where they  17
had ~~had~~ been pursued, and prohibited  11 ẟ
attention to them in the mother‸  18 -/
country.  19 *Run on.*
Long, indeed, after the age of
Ptolemy, the school in connection with  5 *Caps.*
which he flourished, remained in
existence ;‸&c.  20 ’/

‸ *together with the prevalence of its military despotism abroad,*

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1. A wrong letter. A line is drawn through the wrong letter, and the proper one written in the margin. After every mark of correction a line / should be drawn, to prevent its being confounded with any other in the same line. 2. A word or letter to be transposed. Where letters only are to be transposed, it is better to strike them out, and write them in their proper sequence in the margin, like a correction. 3. A *space* wanted. This mark is also used when the spacing is insufficient. 4. A space or quadrat *sticking up*. 5. Alteration of type. One line is drawn under the word for *italics*, two for SMALL CAPITALS, three for CAPITALS. 6. Correction or insertion of stops (*points*). 7. A word struck out, and afterwards approved of (Lat. *stet*, let it stand). 8. A turned letter. 9. An omission. 10. A letter of a wrong fount. 11. A word or letter to be deleted. 12. Alteration of type. 13. A new paragraph. This should be avoided as much as possible, as it causes great trouble and expense. 14. Insertion of a sentence. 15. A *space* to be removed or diminished. 16. A wrong word. This is struck out, and the proper one written in the margin. 17. When letters or lines do not stand even. 18. Mark for a hyphen or rule. 19. No new paragraph. This is also troublesome and expensive. 20. The manner in which the apostrophe, inverted commas, the star and other references, and superior letters and figures, are marked.

The thankless and monotonous business of a corrector or reader is more difficult than the uninitiated would believe. It requires extensive and varied knowledge, accurate acquaintance with the art of typography, and above all, a peculiar sharpness of eye, which, without losing the sense and connection of the whole, takes in at the same time each separate word and letter. After the invention of printing, the C. of the P. was executed by the publisher himself, or at least was intrusted to men of ability and learning, and often men of name. Robert Stephen (1526—1559), and Plantin (1555—1589), had recourse to publicity, hung out the successive sheets of their publications, and promised a reward to any one who would point out a typographical error. Some editions of particular works are held in high estimation from the care with which the press had been corrected. Among the most famous are those that issued from the press of Aldus Manutius in Venice, of which we may mention the works of Petrarch (1514), corrected by Pietro Bembo; Aristotle (1551—1553, 6 vols.), corrected by the famous Greek scholar, J. B. Camotius; Lactantius (1515), and Suetonius (1516), corrected by J. B. Egnatius; Plato (1513), Athenæus (1514), and Gregory Nazianzene (1516), corrected by Marcus Massurus. The first edition of Homer was printed by Nerlius in Florence (1484, 2 vols.), corrected by Demetr. Chalkondylas. Robert Stephen of Paris himself corrected the numerous works that issued from his press; and Erasmus had a great name as a corrector.

**CORRE'GGIO**, ANTONIO ALLEGRI, a celebrated Italian painter, called C. from the place of his birth, a small town near Modena, now called Reggio. He was born in the year 1493—1494, and his father, a tradesman of some property, had him carefully educated, and instructed in the rudiments of art, by an uncle, Lorenzo Allegri, a painter of small merit. How much he owed to his teacher is uncertain. He was the first among the moderns who displayed that grace and general beauty and softness of effect, the combined excellences of design and colour with taste and expression, for which he is still unrivalled. His chiaroscuro is perfect. Almost before he had seen the great masters, he became a master in a style all his own; and was the founder, or rather his imitators for him, of what is called by some the Lombard, by others the Parma school of painting. On first beholding, at Bologna, Raphael's glorious picture of St Cecilia, he is said to have exclaimed: ‘Anch' io sono pittore’ (I, too, am a painter). But this story is doubted.

There was long a tradition that C. lived in indigence, unaided but by his own genius; and it is remarkable that Vasari, who lived at the same time, in his *Lives of the Painters*, records only vague rumours regarding C.'s life; and that Annibale Caracci, fifty years after his death, writes: ‘I rage and weep to think of the fate of this poor Antonio: so great a man—if, indeed, he were not rather an angel in the flesh.’ This belief, so prevalent in his own day, now refuted by recent researches, proves how retired and simple must have been his life. That he was in high estimation in his later days, is proved by his signature being found affixed to the deed of marriage of the Lord of Correggio, celebrated in 1533. C. died the following year, March 5, 1534, in his 41st year, and is buried in the Franciscan convent of Correggio.

At the age of 18, C. painted an altar-piece, the ‘Madonna di San Francesco,’ now in the Dresden Gallery, which is rich in pictures by C.; the most famous of which are the ‘Notte’ (Night), lighted only by the celestial splendour beaming from the head of the infant Saviour—Vasari calls it 'quite wonderful'—and the famous 'Magdalen,' one of the most admired pictures in the world. For the cupola of the church San Giovanni at Parma, he painted an 'Ascension' in fresco, and over the high-altar a 'Coronation of the Virgin,' now only known through copies and engravings. He also decorated elaborately in fresco the cathedral there, for which he received 1000 ducats, worth about £3500. In the Louvre are two pictures—the 'Marriage of St Catharine,' and the 'Antiope;' in the Florence Gallery, three—one the 'Madonna on her knees adoring the Infant;' in the Naples Gallery, three—one a lovely Madonna, called, from its oriental character, 'La Zingarella' (the Gipsy), said to be a likeness of C.'s wife; at Vienna, two; at Berlin, three; at Parma, five—the most celebrated is the 'St Jerome;' and in the British National Gallery, a Madonna, known as the 'Vierge au Panier,' the 'Education of Cupid,' and the famous 'Ecce Homo,' lately purchased by government for £11,500.

**CORRE'GIDOR** is the name given in Spain to the principal magistrate of a town. He is appointed by the king. The C. is also a Portuguese functionary, but, unlike his Spanish brother, does not possess the double power of governing and administering justice, but only the latter.

**CORRELA'TION OF PHYSICAL FORCES.** See FORCE.

**CORRÈZE**, a department of France, formed out of part of the old province of Limousin, and taking its name from an affluent of the Vezère—the Corrèze, which traverses the department from north-east to south-west. C. extends between lat. 44° 55′ and 45° 40′ N., and long. 1° 13′ and 2° 22′ E.; its total area is nearly 2300 square miles, and its population, in 1856, 314,982. The chief rivers of C. are the Dordogne, the Vezère, and the Corrèze. The surface of the department is mountainous, especially in the north and east, where it is broken in upon by offsets from the Auvergne mountains, which, in some parts, attain a height of 4000 feet above the sea. The lower slopes are clad with forests, but the district is in general sterile. In the south and south-west, however, the soil yields wheat, oats, barley, rye, maize, &c. Wine is also produced, but of poor quality. The rural population are poor, badly housed and fed; their food consisting, to a great extent, of chestnuts, which are very abundant. Minerals, particularly coal, iron, lead, alabaster, and granite of various colours, are found in considerable quantities. The department is divided into the three arrondissements of Tulle, Brive, and Ussel. Tulle is the chief town.

**CO'RRIB, LOUGH**, a lake, the third in size in Ireland, in the north of Galway. It is of very irregular shape, 27 miles long from N.W. to S.E., and 1 to 6 broad, with an area of 68 square miles. It is between 28 and 31 feet above the sea-level. From its south end, 4 miles north of Galway, it discharges its surplus waters by Galway River into Galway Bay. It receives the waters of Lough Mask, at its north end, through the Pigeon Hole and other caves, as well as those of the Clare and other smaller rivers. On its sides are metamorphic rocks, carboniferous limestone, and marble. Near it are many monumental heaps and so-called Druid circles. It contains many islets, and to the west are mountains 3000 feet high.

**CO'RRIDOR** is a gallery or passage running (It. *correre*, Sp. *correr*, to run) or leading to several rooms, each of which has a door opening into it. Spacious corridors are necessary in all public buildings, such as hospitals, prisons, &c.

**CORRIE'NTÉS** (in English, *currents*) is a name of various application in Spanish America. Besides indicating several capes in Cuba, Mexico, and New Granada, it is more conspicuously connected with one of the States of the Argentine Confederation and with the capital of the same. 1. C., the city, stands in lat. 27° 27′ S., and long. 58° 46′ W., near the confluence of the Parana and the Paraguay. It takes its name from the rapids, which are said to be as decidedly a turning-point in the climate of the country as in the navigation of the river. Pop. 16,000. 2. C., the province, lies between Entre Rios on the south, and the republic of Paraguay on the north, having the Parana on the north and west. Lat. 27°—30° S., and long. 57°—59° W. Area about 45,000 square miles; pop. 85,000. The north is undulating and fertile; and the south, besides being generally swampy, is partly covered by Lake Thara. The products are maize, cotton, sugar, indigo, tobacco, and a species of silk.

**CORRIEVRE'KIN**, or **CORRYBRE'CHTAN**, or Gulf of Brechan, a whirlpool or dangerous passage a mile broad, off the west coast of Argyleshire, in the strait between Scarba and Jura isles. It is occasioned by the meeting of tides (often running 12 or 14 miles an hour) from the north and west, in the narrow passage into the Sound of Jura, round a pyramidal rock, which rises with rapid slope from a considerable depth to some fathoms from the surface. This rock forces the water in various directions. In stormy weather, at flow-tide, vast openings form in the water, immense bodies of water tumble headlong as over a precipice, then rebounding from the abyss, dash together and rise in spray to a great height. The noise is heard over the isles around. The water is smooth for half an hour in slack-water.

**CORRO'SIVE SU'BLIMATE**, the popular name of Bichloride of Mercury (q. v.).

**CO'RRUGATED IRON** (Lat. *ruga*, a wrinkle). Common sheet-iron, and what is improperly called 'galvanised iron' (i. e., sheet-iron coated with zinc by immersion in a bath of the fused metal), have of late been made available for many useful purposes, by virtue of the great additional strength imparted to the sheets by corrugation, which is merely an application to metallic substances of the old contrivance of 'goffering or crimping,' by means of which the frills of the olden time were made to keep their shape.

The sheets of metal are passed between rollers, the surfaces of which are formed into rounded grooves and ridges, the ridges of one roller filling the grooves of the other. The metal in passing between these is compressed into a waving form, or corrugated. It will be easily understood that a piece of sheet-metal, of given size and thickness, if rolled up to form a tube, will resist a much greater bending strain than when flat. Now the curves of the corrugation may be regarded as a series of half-tubes, and the additional strength is due to the application of the same principle. See STRENGTH OF MATERIALS. Walls and roofs of temporary buildings are now extensively made of this material. Railway sheds, emigrants' houses, temporary churches, store-rooms, and sheds for dockyards, &c., are among the common applications. Mr Francis, of New York, has applied the principle to the construction of light boats, the strength of which, and their power of resisting violent blows, such as boats are subject to on landing through a surge, is said to be remarkably great. On this account, they are proposed to be used for life-boats, ships' boats, &c. They are made by stamping the metal in enormous dies, of the shape and size of the boat, and grooved for the required corrugations. Small boats thus constructed require no internal bracings, the requisite rigidity and strength being given entirely by the corrugations.

**CORRU'PT PE'RJURY.** See Perjury.

**CORRUPT PRACTICES ACT.** The laws relating to bribery, treating, and undue influence at elections of members of parliament, were consolidated and amended by 17 and 18 Vict. c. 102 (10th August 1854), which was continued and amended by 21 and 22 Vict. c. 87 (2d August 1858). Both of these statutes were further continued till 10th August 1860, by 22 and 23 Vict. c. 48 (13th August 1859); and till 10th August 1861, by 23 and 24 Vict. c. 99.

Additional legislation on this very troublesome subject has been attempted in almost every session of parliament. See Election.

**CORRU'PTION OF BLOOD.** See Treason.

**CORRUPTION OF JUDGES.** See Judges.

**CO'RSAC** (*Canis* or *Cynalopex Corsac*), an animal of the dog family (*Canidæ*), found in the deserts of Tartary and in India. In size, it resembles a small fox, but is more slender in body and limbs; it has long and pointed ears, a bushy tail, and is of a reddish or yellowish colour; the form of the head resembles that of the fox. It lives in large communities, burrows, prowls during the day, and not during the night like foxes, and is believed to feed chiefly on birds and their eggs, but not to object even to insect food. There are several Asiatic species closely allied to this.

**CO'RSAIR** (Ital. *corso*, a race), a pirate or sea-robber, but generally limited in its application to the pirates who in former times sailed from Algiers, Tunis, Tripoli, and the ports of Marocco, and were the terror of merchantmen in the Mediterranean and the neighbouring parts of the Atlantic Ocean.

**CO'RSICA**, an island in the Mediterranean, separated from the island of Sardinia by the strait of Bonifacio on the south, and situated in lat. 41° 20′—43° N., and long. 8° 30′—9° 30′ E. It forms the French department of Corse, and has an area of 3340 square miles, with a population, in 1856, of 240,183. The greater portion of the island is occupied by ranges of rugged mountains, the highest being Monte Rotondo (ancient *Mons Aureus*), 9068 feet high, and covered with perpetual snow. There are several rivers in the island, the largest of which, having their source in Monte Rotondo, are the Tavignano (ancient *Rhotanus*) and the Golo (ancient *Tavola*). They flow into the sea on the east coast; the Golo is navigable for boats. Several small rivers, most of which are dry in summer, flow westward into the sea. The soil is generally fertile in the valleys, yielding all kinds of cereals, and much wine is produced. Olive, orange, fig, almond, and other fruit-trees flourish; fruit forming a considerable item in the exports. But C. is chiefly celebrated on account of its magnificent forests of oak, pine, chestnut, beech, larch, cork, &c. Many of the pines are upward of 120 feet high, and are much used for masts in the French navy. The chestnut forests are particularly fine, and the fruit serves as an important article of food for the inhabitants. Prickly-pear, arbutus, myrtle, &c., abound. Iron, lead, black manganese, antimony, marble, and granite of beautiful quality, are found on the island, but these sources of wealth are not developed. Sheep of a peculiar black breed, with four and occasionally six horns, goats, and pigs are numerous, and the rearing of cattle is carried on to a great extent. Tunny, pilchard, and anchovy abound along the coast. C. is vided into the five arrondissements of Ajaccio, Bastia, Calvi, Corte, and Sartene. Ajaccio is the capital. The language spoken in C. is a corrupt Italian. The Corsicans are great *improvisatori;* valour, love of freedom, and desire of revenge are their principal characteristics.

In early times C. was known as *Cyrnos*, although its native name is said by some historians to have been the same as that it now bears. As early as 564 B.C., a colony of Phocæans had founded a city on its east coast. After successive changes of Carthaginian, Roman, Vandal, Greek, and Gothic rulers, it came in the 8th c. into the hands of the Saracens, who held it until the beginning of the 11th c., when it fell under the dominion of Pisa. It afterwards passed to the Genoese, who held it until 1755, when the Corsicans under General Paoli made themselves in great part independent. The French, to whom the Genoese surrendered the claims they themselves could not maintain, captured it in 1768; since which time, with slight intermission, it has remained in the possession of France.

**CO'RSLET** was the body-covering of pikemen. The C. was made chiefly of leather, and was pistol-proof.

**CO'RSNED**, or morsel of execration, was a piece of cheese or bread made use of in early times with a view to ascertain whether persons suspected of any crime were guilty or innocent. The C., according to Blackstone, 'was consecrated with a form of exorcism, desiring of the Almighty that it might cause convulsions and paleness, and find no passage, if the man was really guilty, but might turn to health and nourishment if he was innocent.' In this mode of divination, barley-bread appears to have had the preference. It was one of the many forms of ordeal (q. v.).

**CO'RSO** (literally, course or running) is an Italian word used to express not only the racing of horses (without riders), but also the slow driving in procession of handsome equipages through the principal streets of a town, such as almost always takes place in Italy on festivals. This custom has given a name to many streets in almost all the larger towns of Italy. The best known of these is the C. in Rome, which is the scene of the celebrated diversions of the Carnival.

**CORT**, Cornelis, a famous Dutch engraver, was born at Hoorn in 1536. In 1572 he went to Venice, and was hospitably received there by Titian. Being less of a painter than of an engraver, he seems very soon to have been employed by the great Venetian colourist for the reproduction in copper-plate of some of his master-pieces; and it appears he did it so well, that he afterwards engraved for Tintoretto and other Venetian masters. C. next settled at Rome, where he erected an engraving school, and had among his pupils Agostino Caracci, and from this school sprang the most excellent Italian and Venetian engravers. C.'s works had a favourable influence on the graver's art in the Netherlands. He died at Rome in 1578. His engravings, considering his short life of 42 years, are very numerous, amounting to more than 150.

**CO'RTÉS** is the name given in Spain and Portugal to the assembly of representatives of the nation. As one district of Spain after another was recovered by the Christian princes from the Moors, there arose in each a corporation composed of the different 'States' or orders of the population, limiting the power of the princes. From the union of several of these territories were formed the two leading kingdoms of Castile and Aragon, having each its C., representing the clergy, the nobility, and the cities. In Aragon, the C. appointed a judge, *el justicia*, who decided disputes between the king and his subjects, and confined the royal power within constitutional limits. In Castile the rights of the burghers were less extensive than in Aragon, but in both states the king was dependent on the Cortes. After the union of Castile and Aragon under Ferdinand and Isabella, the crown succeeded in making itself less dependent on the C., whose power and privileges were gradually encroached upon, until at last they were seldom assembled except to do homage or to sanction an arrangement as to the succession to the throne. After 1713 they did not meet till 1789, on the accession of Charles IV. In 1809, the C., as composed in 1789, was assembled by the Junta, and framed a new constitution, called the Constitution of 1812, which, however, was set aside at the restoration. Endless attempts at restoration and modification of the Spanish C. have since been made, without any happy result. See SPAIN.

The history of the Portuguese C. is very similar to that of the Spanish. In 1826, Don Pedro promulgated a new constitution after the model of the French, calling the C. again into life, and abdicating at the same time in favour of his daughter, Maria da Gloria. This constitution was set aside during the usurpation of Dom Miguel, but was finally restored in 1842.

**CORTÉS**, HERNAN, the daring conqueror of Mexico, was born in 1485, at Medellin, a village of Estremadura, Spain. He was educated for the law, but afterwards adopted the profession of arms; and in 1511 distinguished himself under Diego Velasquez in the expedition against Cuba. In 1518 the conquest of Mexico was intrusted to him by Velasquez, who was then governor of Cuba; but the latter had no sooner granted him the commission than he wished to revoke it, fearful that his dashing and sagacious lieutenant would deprive him of all the glory of the enterprise. C., however, maintained his command in defiance of the governor. Never, perhaps, was an enterprise so great undertaken with so little regard for its difficulties and dangers. A force of between 600 and 700 men, only thirteen of whom were musketeers, with only ten field-pieces and two or three smaller pieces of cannon, were all the means at C.'s disposal to effect the conquest of the then extensive empire of Mexico, when, early in 1519, he landed on its shores. Sailing up the river Tabasco, C. captured the town of that name, the prowess of the Spaniards occasioning great terror to the Tabascans, who made liberal presents to the white men, and volunteered all the information about Mexico in their power. Arriving off the coast of San Juan de Ulloa, C. was here visited by some Mexican chiefs, with whom he entered into negotiation regarding a visit to Montezuma, who then ruled with nearly absolute sway over Mexico. Montezuma sent C. rich presents, but objected to his visiting the capital. But C. had resolved upon seeing the emperor in his palace, and was not to be daunted by opposition. Having founded the town of Vera Cruz, and burnt his ships, so that his troops could not return, and must therefore conquer or perish, C., with a force reduced to 400 Spaniards on foot and 15 horse, but with a considerable number of Indian followers, lent him by dissatisfied chiefs dependent on Montezuma, marched upon the capital. Overcoming the Tlascalans, a brave people, on the way, who after became his firm allies, and taking fearful vengeance on the city of Cholula, where, by Montezuma's orders, a treacherous attempt was made to massacre his troops, C. on the 8th November 1519 reached the city of Mexico with his little band, and was received with great pomp by the emperor in person. The Spaniards were regarded as those descendants of the sun who, according to a current prophecy, were to come from the east and subvert the Aztec empire—a tradition that was worth a good many soldiers to Cortes. An attack on C.'s colony at Vera Cruz by one of Montezuma's generals, however, proved the mortality of the Spaniards, and would have been the ruin of them but for the decisiveness of C., who immediately seized the emperor, and carrying him to the Spanish quarter, forced him to surrender the offending general and three other chiefs, whom he caused to be burnt in front of the palace, and ere long compelled him formally to cede his empire to Spain. One has nothing but astonishment for this man, whose daring acts in the capital city of the empire, containing, it is calculated, 300,000 inhabitants, had nothing but 400 Spaniards, and a few thousand Indians, whom he had recently conquered, to support them. Meanwhile Velasquez, enraged at C.'s success, sent an army of about 1000 men, well provided with artillery, to compel his surrender. C. unexpectedly met and overpowered this force, and secured its allegiance. But in his absence the Mexicans had risen in the capital, and C. was finally driven out with much loss. During the disturbance, Montezuma, who was still kept a prisoner, appeared on a terrace with the view of pacifying his people; but he was wounded by a stone, an indignity against his kingly person which he took so much to heart that he died in a few days. C. now retired to Tlascala, to recruit his fatigued and wounded men; and receiving reinforcements, he speedily subjugated all Anahuac to the east of the Mexican valley, and soon marched again on the city of Mexico, which he succeeded in capturing (August 16, 1521) after a siege of four months ended by a murderous assault of two days. Famine had assisted the Spanish arms, so that of the vast population only about 40,000 remained when the Spaniards entered the city, which lay in ruins, 'like some huge churchyard with the corpses disinterred and the tombstones scattered about.' Mexico was now completely subjugated, for though some attempts at revolt were afterwards made, they were soon crushed by C., who had been nominated governor and captain-general of the country by Charles V. In 1528, C. returned to Spain, to meet some calumnies against him, and was received with great distinction. On his return to Mexico in 1530, however, he was divested of his civil rank. At his own expense he fitted out several expeditions, one of which discovered California. In 1540 he came again to Spain, but was coldly received at court, from which he soon retired, and died at Seville, December 1547.

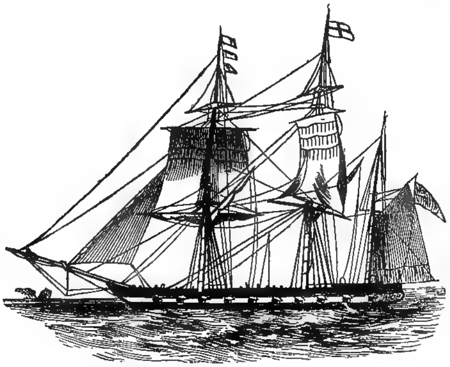
**CORTONA**, a town of Central Italy, about 50 miles south-east of Florence. It is beautifully situated amid vineyards on a hill rising from the fertile valley of the Chiana, and commanding a fine view of the lake of Perugia (ancient Thrasymene). The city is of fabulous antiquity, older, it is said, than Troy; and the Cyclopean walls, erected by the Pelasgians—which in many parts remain unchanged—prove, if not a history quite as old as tradition affirms, at all events one second in remoteness to few places in Italy. It was one of the most powerful of the twelve cities forming the Etruscan League. By the Romans, who settled a colony here about the time of Sulla, it was called *Corythus*. After many vicissitudes during the middle ages, the town became subject to Florence in the 15th century. Besides the walls, there are several objects of Etruscan antiquity at Cortona. The modern town contains about 5000 inhabitants. Among the principal buildings are the cathedral, dating from the 10th or 11th c., with some fine paintings and monuments, the churches of Jesus, St Francesco, and others. The Etruscan Academy has its seat here, the museum connected with which contains a multitude of Etruscan sarcophagi, vases, &c. C. has a trade in wine and olives, and fine marble is found in the vicinity.

**CORU'ÑA** (English, *Corunna*), a fortified seaport of Spain, situated on a small headland in the Atlantic, formed by the three bays of Betanzos, Coruña, and El Ferrol, about midway between Capes Finisterre and Ortegal, in lat. 43° 22′ N., long. 8° 22′ W. C., which is a thriving place, is built partly on the slope and partly at the foot of a hill, and is divided into the upper and lower towns, the former being the most ancient. The lower town, which was formerly inhabited chiefly by fishermen, is now more important than the upper. It is well built, chiefly of granite, and some of its streets are broad and well paved. There are few public buildings of any note in Coruña. A citadel defends the town, and the harbour, protected by forts, is safe and commodious. In 1856, 169 vessels, with an aggregate tonnage of 23,933 tons, entered, and 141 vessels of 21,901 tons burden cleared the port. During the same year, the imports amounted to £230,672, and the exports to £98,259. Pop. 20,000. C. dates its origin from the Phœnicians, from whom it was taken by the Romans in the 1st c., B.C. For Englishmen, great historical interest attaches to Coruña. Here, in 1386, John of Gaunt landed to claim the crown of Castile in right of his wife, daughter of Pedro the Cruel; in 1554, Philip II. embarked here for England to marry Queen Mary; and in 1588 the great Spanish Armada, which had been refitted at this port, set sail for the conquest of England. But C. is best known in connection with the death of Sir John Moore, who, as a fitting conclusion to his memorable retreat, with about 14,000 men defeated (January 16, 1809) on the heights of Elvina, behind C., 20,000 French under Soult. Moore, who was mortally wounded in the action, was buried on the ramparts in his military cloak. A monument, erected by the British government, marks the place of his burial.

**CORU'NDUM**, a mineral consisting essentially of mere alumina, yet of great specific gravity—about four times that of water—and of remarkable hardness, being inferior in this respect only to the diamond. Mineralogists regard the sapphire as a variety of C., and along with it the gems popularly known as Oriental Ruby, Oriental Topaz, Oriental Emerald, and Oriental Amethyst; but the name C. is more usually limited to the coarser varieties, to which it is applied by the natives of India. These, instead of exhibiting the brilliancy of gems, are in general of a dull and muddy appearance, and the crystals—which are usually six-sided prisms, and six-sided pyramids—are externally dull and rough. The colour is various, often green, blue, or red, inclining to gray. The variety called *Adamantine Spar* is of a hair-brown colour and adamantine lustre. Some corundums—known as *Asteria Sapphires* or *Star Sapphires*—when cut in a particular manner, exhibit an opalescent star of six rays. C. is found in many parts of the world, and has long been used in India for polishing all gems except the diamond, which is too hard for it, and also for polishing the stones used in temples and other buildings. Emery (q. v.), so well known as a polishing substance, is a variety of corundum.

**CORVEI** (*Corbeia nova*), a Benedictine abbey on the Weser, near Höxter, the oldest and most famous in early Saxony, founded in the beginning of the 9th century. It was a colony from the monastery of the same name in Picardy, then part of the country of the West Franks. It received rich endowments; was the centre of great agricultural improvement and prosperity during the earlier part of the middle ages; and the seat of a school, founded by Ansgar, the Apostle of the North, which flourished greatly in the 9th and 10th centuries, and was next in reputation to Fulda. Its abbots were numbered amongst the spiritual princes of the German empire. In 1794 it was made a bishopric by Pius VI. Its territory then extended to about 22 square miles, with 10,000 inhabitants. In 1803 it was annexed to Nassau, from which it was transferred in 1807 to Westphalia, and in 1815 to Prussia. In 1822 the lands belonging to the ancient abbey passed into the hands of Count Victor Amadeus von Helsen-Rheinfels-Rotenburg, which were formed into a mediate principality of the Germanic empire. The church of the abbey is built in the Gothic style, very magnificently adorned in the interior, and contains a multitude of monuments of successive dynasties. The library and archives of the cloister, which contained most valuable records of the early ages of German history, have all been destroyed—the authenticity of the *Chronicon Corbejense*, an alleged record of this abbey from its foundation to the end of the 12th c., being doubtful.

**CORVE'TTE**, is a flush-decked vessel, ship-rigged, but without a quarter-deck, and having only one tier of guns.



Corvette (20 guns).

**CO'RVIDÆ**, a family of birds of the order *Insessores*, tribe *Conirostres*, having a strong bill, compressed towards the point, and covered at the base with stiff, bristly feathers, which advance so far as to conceal the nostrils. The plumage is dense, soft, and lustrous, very generally dark, but sometimes of gay colours, more particularly in the tropical species. The birds of this family are widely diffused over the world. They are generally birds of strong and rapid flight; some of them are solitary, some gregarious in their habits; some reside in woods, some in moors and wastes, some on sea-coasts, &c. They are very omnivorous. They are also remarkable for their intelligence, their prying curiosity, and their disposition to pilfer and secrete glittering articles. Besides the crows, raven, rook, and jackdaw, which belong to the genus *Corvus*, the magpie, jay, chough, and nut-cracker are included among the C. of Britain.

**CO'RVO**, the most northerly of the Azores, is the smallest among the inhabited islands of the group. It measures only 6 miles by 3, the latitude of its southern point being 39° 42′ N. It is of volcanic origin, and has, in an exhausted crater, a small lake 1277 feet above the sea. With a fertile soil and a delicious climate, C. contains barely 1000 inhabitants, and these generally poor.

**CO'RWEN**, a town in north Wales, in the north-east of Merionethshire, situated on the right bank of the Dee, 10 miles west of Llangollen. It is sheltered by a rock at the foot of the Berwyn mountains. Pop. of parish, 2069. Here the Welsh under Owen Gwynedd defeated Henry II., and afterwards under Owen Glyndwr defeated Henry IV.

**CORYDA'LIS.** See FUMARIACEÆ.

**CORYGAU'M**, an insignificant village in the presidency of Bombay, is historically interesting in connection with the final subjugation of the Peishwa of the Mahrattas. On 1st January 1818, it was defended for nine hours by a mere handful of men under Captain Staunton against a native force numbering at least 3000 infantry and about 20,000 cavalry, the struggle terminating in the repulse of the assailants after terrible slaughter. C. stands 16 miles to the north-east of Poona, in lat. 18° 39′ N., and long. 74° 8′ E.

**CORYLA'CEÆ.** See CUPULIFERÆ.

**CO'RYLUS.** See HAZEL.

**CO'RYMB**, in Botany, a form of *indefinite* and *centripetal* inflorescence, in which the flowers are arranged as in a raceme (q. v.), but the lower flower-stalks are elongated so as to bring the flowers almost to the level of those of the upper. The C. is a very common form of inflorescence.

**CORYMBI'FERÆ.** See COMPOSITÆ.

**CORY'MBUS** (Gr. *korumbos*), the particular mode of dressing the hair among the Greeks, with which the statues of Venus have rendered us familiar. The hair was often covered with a sort of open ornamental work.

**CO'RYPHA.** See FAN PALM, GEBANG PALM, and TALIPOT PALM.

**CORYPHÆ'US** (from Gr. *koruphe*, a summit), the name given by the ancients to the leader of a chorus of singers or of a company of dancers. It is now used to signify those who are of the highest distinction in any art or science.

**CO'RYPHENE** (*Coryphæna*), a genus of fishes of the family *Scomberidæ*, to which the name DOLPHIN, properly belonging to a genus of *Cetacea*, has by some mistake been popularly transferred. The coryphenes are remarkable for the beauty and metallic brilliancy of their colours, which delight the spectator as they are seen gliding with extreme rapidity near the surface of the water, gleaming in the light of the sun; and the changes of which, as they lie dying on the shore or on the deck of a vessel, have acquired a peculiar poetic celebrity. They have an elongated compressed body, covered with small scales, the head rising in a sharp crest, the mouth large. They are natives of the seas of warm climates, and some species are found in the Mediterranean, among which is *C. hippuris*, the largest known, attaining a length of five feet. This and some of the other species are often seen playing around ships; and great interest is occasionally awakened by their pursuit of shoals of flying-fish. In this chase, a C. may be seen to dart completely out of the water, making a leap of ten yards or more. Captain Basil Hall likens the velocity to that of a cannon-ball. The C. is often caught by sailors, with a glittering bit of metal instead of a bait.

**COS** (more anciently, Meropis), an island of the Grecian Archipelago belonging to Asiatic Turkey. Its modern name is Stanko or Stanchio. C. has a length of 23 miles, with a breadth of 5, and a population of 8000, two-thirds of whom are Greeks, the others being Turks and Jews. On the eastern side of the island a range of hills extends along the coast, from Cape Fonka on the north, to Point Korkilo on the south; but with this exception, C. consists mostly of delightful and fertile plains, which are well cultivated. There are many mineral springs on the island. Since 1850, when a severe frost damaged the greater part of the lemon, orange, and other fruit trees, the trade of C. has not been so extensive as it formerly was. The value of the exports, consisting principally of raisins, lemons, salt, and grain, amounted in 1859 to about £30,000. The chief imports are oil, soap, butter, butcher-meat, and English manufactures. The island pays annually to the Turkish government £2500, £1900 of which is paid by the Greeks. The climate in general is pretty healthy. Many ancient Greek remains are scattered over the island. The chief town, Comopolis or Cos, is situated on the north-east coast. It is built on the ruins of the ancient city of the same name; and in the centre of the chief street is a gigantic palm-tree, said to have stood there before the Christian era. To the north-west is an old fortress of the knights of St John. The harbour is small, with only about 6 feet of water in it. The inhabitants are employed chiefly in agriculture. Modern Greek is the language spoken. In early times, C. was sacred to the worship of Æsculapius. It was the birthplace of Ptolemy Philadelphus, of the painter Apelles, and the physician Hippocrates.

**COSCINO'MANCY**, a species of divination practised from the earliest times by means of a sieve (Gr. *koskinon*) and a pair of shears or forceps. It appears to have been chiefly employed for the discovery of thieves. The sieve was supported or suspended by means of the shears, in some way not easily understood; a certain mystical form of words was then used, and the names of the suspected persons being mentioned in succession, at the name of the thief the sieve moved or turned round.

**COSE'NZA**, a town of Naples, capital of the province of Calabria Citra, about lat. 39° 20′ N., long. 16° 15′ E. It is situated 12 miles east of the Mediterranean, in a mountain-enclosed valley at the confluence of the Crati and the Busento, the waters dividing the town into two parts. The lower town is much affected by malaria arising from the river marshes, but the upper town is tolerably healthy. It is the residence of the principal families, and contains some handsome buildings, including a cathedral, and an unusually fine court-house. The streets generally are narrow and crooked. C. has considerable industry, the principal articles of manufacture being silk, earthen-ware, and cutlery. Pop. about 10,000. Anciently, C., called *Consentia*, was a city of the Brutii. It was captured by the Carthaginian general Himilco, and was forced to surrender (204 B. C.) to the Romans, who afterwards colonised it. Alaric the Goth died here 410 A. D., and is buried in the bed of the Busento. C. continued of considerable importance throughout the middle ages.

**CO-SINE, CO-TANGENT**, &c. See TRIGONOMETRICAL FUNCTIONS.

**CO'SMAS**, surnamed *Indicopleustes*, a merchant of Alexandria, who lived in the middle of the 6th c., and after having travelled much, returned to Egypt, where he spent the evening of his days in monastic retirement, and wrote a 'Christian Topography' in 12 vols., in the Greek language, containing much information about many countries, and particularly about India. An attempt to reconcile everything to his notions of the meaning of the Bible has led him into many errors. The work (which, among other things, gives the first account of the *Monumentum Adulitanum*, see ADULE) has been edited by

Montfaucon in the *Nova Collectio Patrum Græcorum,* vol. ii. (Par. 1707). C. wrote also a description of the plants and animals of India, which was published by Thevenot in his *Relations de Divers Voyages Curieux,* vol. i. (Par. 1666).

**COSME'TICS** (Gr. *kosmeo,* I adorn) are chemical preparations employed for improving the appearance of the skin and hair. Several of the C. in use are comparatively harmless, such as perfumed starch and chalk; whilst others, such as *pearl white* (the subnitrate of bismuth), are more or less poisonous, and dangerous to use. At all times, the employment of C. is not to be commended, as the minute particles tend to fill up and clog the pores of the skin, and prevent the free passage of gases and vapours, which is so essential to the preservation of any animal organ in a thorough state of health.

**COSMO DE' MEDICI.** See Medici.

**COSMO'GONY** (Gr. *kosmos,* the universe; *gonè,* generation) is the (so-called) science of the formation of the universe. It is thus distinguished from cosmography, which is the science of the parts of the universe as we behold it (a science embodied in the work of Humboldt, entitled *Cosmos*), and from cosmology, which reasons on the actual and permanent state of the world as it is. Geogony, which confines itself to the formation of the earth, and speculative geology, are but subdivisions of cosmogony.

Cosmogonists proper may be divided into two classes—the Theistical, and the Pantheistical. According to Theistic C., the world of matter and order sprang at once into existence at the Omnific fiat. The chief speculations from this point of view, have of late been regarding the *date,* if the expression may be used, of the world's formation, and, looking to the facts of geology and astronomy, the precise condition of the cosmos when evoked; how much, in short, of the evolution, since the date, is attributable to the operation of secondary causes. The Pantheists hold the universe, on the other hand, to be the very body and being of Deity, and as such to have been from all eternity. God is all things, and all things are God—a conclusion reached from pure *à priori* reasoning, and that seems to exclude all further inquiry.

Men of science, in modern times, stopping short of an actual C. or genesis of the world, have pushed their inquiries into the order of development of its present state, which they, or at least some of them, aver to have taken place from the first by the divine power exercised in the manner of natural law. They assume the existence of matter; and with them there is no proper beginning of things, but an eternal round, under fixed laws of growth and decay.

In cosmogonical speculations, heat, air, atoms with rotatory motions, numbers—all in turn have had the honour of being recognised as the fountain and causes of things. Latterly, there has been a tendency to dynamical hypotheses, not only of the formation of our own rotating globe, but of our system, and of all similar systems in space. Of these, the chief is that of Laplace, founded on observation of the mutual relations of the planets, their common direction in rotation and revolution, their general conformity to one plane, &c.; taken in connection with such facts as the rings of Saturn and the fundamental unity of the asteroids. Thus arose the Nebular Theory (q. v.), which at one time had a support from Sir William Herschel's observations on the *nebulæ;* of which, however, the discoveries by Lord Rosse's telescope in a great measure deprived it. Following up this view of a formation of the globes by natural causes, there have been speculations as to the commencement and progress of organic life upon them by similar means: these are to be found in the *Philosophie Zoologique* of Lamarck; the *Vestiges of the Natural History of Creation;* and in the work of Charles Darwin on the *Origin of Species by a Principle of Natural Selection;* all of which involve great differences of view among themselves, though all meeting in one point—an assimilation of the processes of creation to the ordinary natural course of things presumed to be arranged and conducted by the Deity.

**COSMORA'MA** (Gr. *kosmos,* the world, and *orao,* to see), an exhibition of views from different parts of the world. See Diorama.

**CO'SMOS.** See Cosmogony.

**COSNE,** a town of France, in the department of Nièvre, about 30 miles north-north-west of Nevers. It is situated on the right bank of the Loire, here crossed by a suspension-bridge, is generally well built, and has iron forges and manufactures of cutlery. Pop. 5000.

**CO'SSACKS** (Russ. *Kasacks*), a race, in appearance, manners, and language, very much resembling the Russians. The name Kasack is of Turkish or Tartar origin, signifying, in the Turkish language, a robber, in the Tartar, a light-armed warrior.

Cossack of the Don—Officer in Full Dress.

The C. are not, however, akin to the Turks or Tartars, but are descendants of the ancient Russians of Novogorod and Kiew, to whom the necessity of maintaining a constant resistance to enemies has given a peculiar warlike character. There are two principal branches of the Cossack family—the Malo-Russian C. or C. of Little Russia, and the Don Cossacks. The former are the more wild and rude. To this branch belong the *Saporogi* C., who dwell beside the water-falls or *Parogi* of the Dnieper, and are the most unscrupulous robbers of all. The Don C. inhabit the great steppes to the north of the Sea of Azof and of Caucasia. Their country forms a Russian government by itself, of about 60,000 square miles in extent, and with a population of 871,130. The capital is Nowotscherkask (q. v.). The C. belong to the Russian Greek Church. Their military chief, called the Ataman or Hetman, resides at Nowotscherkask. To the Don Cossack branch belong the *Tchernomorski* C., who inhabit the steppes of the Kuban—the C. of the Volga, who are scattered through the governments of Astrakhan and Saratow—the C. of the Terek, of the Ural, of Azof, and of Siberia. The whole number of the C. is reckoned about 1,900,000. They contribute much to the military strength of Russia; but several insurrections, of which the most alarming was that of 1773, have taken place since they became subject to the Russian government.

**COSSIMBAZA'R**, in English, *Cossim's market*, stands on the Bhagirathi, which is the first or most westerly offset of the Ganges, and unites with the Jellinghee to form the Hoogly. It is in lat. 24° 8′ N., and long. 88° 18′ E., being 120 miles by land to the north-east of Calcutta. It contains about 4000 inhabitants. C. was at one time famous for its silk-manufacture, which, however, has, in a great measure, yielded to British competition. It is now worthy of notice chiefly as the river-port of Moorshedabad, of which it is, in fact, a suburb. Such is its prominence in this respect, that it often gives its own name to the stream on which it is situated.

**CO'SSUS.** See GOAT MOTH.

**COSTA**, ISAAC DA, an eminent poet and religious writer, was born at Amsterdam, January 14, 1798. His parents were Portuguese Jews, who had settled in Holland. The first aspiration of his poetical genius having been shewn by his Hebrew teacher to Bilderdijk, the latter expressed himself favourably regarding it, and a warm and lasting friendship sprang up between him and Costa. In his twentieth year, C. acquired the degree of Dr at Law; and shortly after, having embraced Christianity, was baptized. This subjected him to considerable persecution, which, however, subsided as his genius gradually gained recognition. The most interesting of his writings to the British public are probably his translation of Byron's *Cain*, his *Israel and the Gentiles*, and *Harmony of the Gospels*, the last two of which have been translated into English. As a public lecturer, C. specially excelled. His *Battle of Nieuwpoort*, the last of his poems, is one of his master-pieces. He died, April 28, 1860, and, though privately buried, was honoured with a concourse unexampled, except when De Ruyter and Van Speyk were interred with public pomp in the same *Nieuwe Kerk* at Amsterdam.

**COSTA**, MICHAEL, a very popular musician and composer, was born at Naples, February 1810. As he early shewed a decided talent for music, he was sent to the Conservatoire in his native city for education, where he greatly distinguished himself. In 1828, his fame, though he was then but 18, having reached England, he was invited to take part in the Birmingham Musical Festival, an invitation he complied with; and he was so well received in this country that he resolved to settle in it. In 1830, he was appointed conductor of the music in the Italian Opera in the King's (now the Queen's) Theatre, an office which, in 1847, he resigned for a similar one in the Royal Italian Opera, Covent Garden, a position he still retains. As conductor of the Philharmonic Concerts, and the concerts of the Sacred Harmonic Society, he has, by his universally recognised ability, contributed greatly to their success. C. is the author of several popular ballets and of some operas, the most successful of which was *Don Carlos*. His greatest effort, however, is his oratorio of *Eli*, first performed at the Birmingham Musical Festival of 1855, and generally admitted to be one of the finest works of the kind produced within the last hundred years.

**CO'STA RI'CA**, the most south-easterly state of Central America. It occupies the entire breadth from sea to sea between Nicaragua on the one side and New Granada on the other, stretching in N. lat. from 8° to 10° 40′, and in W. long. from 83° to 85°. With an area of 16,250 square miles, it is estimated to contain 215,000 inhabitants. The country is generally mountainous—more so on the north-east than on the south-west—with many volcanoes, the temperature becoming mild and salubrious in proportion to the elevation. It yields gold and silver, tobacco, sarsaparilla, indigo, sugar, cocoa, and dyewoods. The principal staples, however, of foreign trade are coffee, hides, and cedar. These are exported chiefly from Punta Arenas, on the Gulf of Nicoya, an inlet of the Pacific Ocean. The other places of any note are San José, the capital, and the cities of Cantago, Alajuela, Eredia, Estrella, and Esparsa. The government is republican, with a revenue of less than £20,000 sterling a year. Of late years, in consequence of the piratical expeditions of the notorious fillibuster, William Walker, Costa Rica has, commercially as well as politically, suffered much. The official returns, accordingly, indicate not merely the absence of a progressive advance, but occasionally a considerable decline. In 1858, the imports amounted to £200,000, of which £136,600 were from Britain; the exports to £192,847, of which £40,117 were to Britain.

**COSTE'LLO**, LOUISA STUART, a voluminous English authoress, was born in 1815. Her first production, at least of any note, was *Specimens of the Early Poetry of France* (1835), but it is as a tourist she has gained the greatest popularity. The works in which she describes her travelling-trips are —*A Summer amongst the Bocages and the Vines* (1840); *A Pilgrimage to Auvergne*, &c. (1842); *Béarn and the Pyrenees* (1844); *The Falls, Lakes, and Mountains of North Wales* (1845); and *A Tour to and from Venice by the Vaudois and the Tyrol* (1846). Miss C. has also written several novels, the principal of which are *The Queen-mother* (1841), and *Jacques Cœur, the French Argonaut* (1847). In 1853, she published a work of a professedly historical character, entitled *Memoirs of Mary, the Young Duchess of Burgundy;* and in 1855, another of the same kind, *Anne of Brittany*. Miss C. writes in a very pleasant and picturesque style.

**CO'STER**, LAURENS JANSZOON, according to the Dutch, the inventor of printing, was born at Haarlem about the year 1370. The time of the invention ascribed to him must have fallen between the years 1420 and 1426. C. at first worked in secret, because, he being a sacristan, his art, if known, would have brought him into unpleasant collision with the manuscript-writing clergy, whose productions he tried to imitate, even to the abbreviations; thus his name did not appear on the productions of his press. As custom increased, C. had to take apprentices; and one of them, a German, Johann, making use of the confusion occasioned by C.'s death in 1439, is said to have purloined the greater part of his master's types and matrices, and to have fled to Mayence, where he brought the hidden art to light. This Johann was probably Johann Gänsfleisch, a member of the Gutenberg family. Such, at least, is the history of the invention of printing as given by the Dutch, and which they support by the testimony of Hadrianus Junius, the historian of the States of Holland. Moreover, a celebrated printer of Cologne, Ulrich Zell, deceased about the year 1500, is said to have declared 'that Gutenberg, *his master*, had derived his art from Holland, after the model of a *Donatus* printed there.' Now, a Donatus of C.'s time still exists; it was produced in 1470 by Johannes Enschedé, also a celebrated printer of Haarlem; and no sooner had his discovery been made known in Meerman's *Originês Typographicæ*, than fragments of the same work appeared in such quantities, that no one could any more aver that this early monument of imperfect typography, mostly printed from indisputably Dutch types, had been struck off from Gutenberg's press. Gutenberg's works, even now, are models of impression; those ascribed to C., *at first printed on one side only*, are the first proofs of a beginner. Then, all the characters of the oldest Dutch printed books resemble the Dutch handwriting of the first half of the 15th c., a proof of the independent nature of the attempts towards imitating manuscripts for sale. Other evidences are given by the Dutch that C. was the true inventor of printing; the most eminent advocates of his claims being Meerman, Koning, Scheltenne, Van Westreenen, Van Tiellandt, De Vries, Schinkel, Noordziek Ebert, Leon de Laborde, Paul Lacroix, and Bernard. In the town-house of Haarlem, the typographical remnants of the productions ascribed to C. are preserved. See PRINTING; and for the German account of the invention, GUTENBERG. As for C., his memory still is held in due honour by the town of his birth; the site of his house is still pointed out with pride; and, besides the monument of 1823, in the Haarlem Wood, a bronze statue of him, by Royer, was erected with national solemnity in the market-place of Haarlem, July 16, 1856.

**CO'STMARY** (i. e., *cost*, or aromatic plant, of the Virgin Mary), or **ALE-COST** (*Balsamita vulgaris*), a perennial plant of the natural order *Compositæ*, sub-order *Corymbiferæ*, a native of the south of Europe, which has long been cultivated in gardens in Britain for the agreeable fragrance of the leaves. The root-leaves are ovate, of a grayish colour, on long footstalks; the stem is 2—3 feet high; the stem-leaves have no footstalk; the small heads of flowers are in loose corymbs, deep yellow. The leaves were formerly put into ale and negus, and are still used by the French in salads.

**COSTRO'MA**, or **KOSTROMA**, a town of European Russia, capital of the province of the same name, is situated at the confluence of the Costroma with the Volga, in lat. 57° 45′ N., long. 41° 12′ E. C., which is said to have been built in the 12th c., is surrounded by earthen-walls, now converted into walks. The town is divided into three portions: one, containing the cathedral and many handsome structures, occupies a height; and between it and the lower town, which is built along the bank of the Volga, and composed of houses of wood and stone, interspersed with gardens, is a third quarter, consisting entirely of stone houses. C. is a thriving place, with manufactures of linen, leather, soap, and Prussian blue. It has also a bell-foundry. Pop., 14,000.

**COSTS**, the technical name in English law for the expenses incurred in legal proceedings. As a general rule, the C. of the successful party are paid by the loser, but the rule is subject to important exceptions. 1. A party suing or defending *in formâ pauperis* (to entitle him to which privilege he must swear that he is not worth £5), does not pay C., though he is entitled to receive them if successful. 2. In actions in which the plaintiff recovers damages under 40*s*., he is, in certain cases, not entitled to C., unless the presiding judge certifies that he ought to have them; and in all other cases, he is not entitled to them, if the presiding judge certifies that he ought not to have them. 3. A plaintiff who might have brought his action in the county court, is not entitled to C. if he sues in the higher courts, and recovers not more than £5 in certain actions, or £20 in others, unless the judge who tries the case certifies that it was proper the action should have been brought in the higher court. 4. A party who is successful in the main, and therefore entitled to the 'general costs,' may be unsuccessful upon some minor point, and therefore bound to pay the C. which belong properly to it. 5. A party who has tendered the amount recovered, and who pays the sum into court, and pleads the tender, is not bound to pay costs. 6. The payment of money into court in the course of an action relieves the party paying from C. of subsequent proceedings, if no greater amount be ultimately recovered.

C. formerly used to be given neither to nor against the crown, either in its fiscal, public, or private capacity; but by 18 and 19 Vict. c. 90, and 23 and 24 Vict. c. 34, the crown is now entitled to C., and bound to pay C. in the same way as a private suitor.

C. are taxed (i. e., the items allowed or disallowed) by the officer of the court appointed for the purpose under the name of the master. When so ascertained, they are, if in favour of the plaintiff, included in the amount for which judgment is given, if it be in his favour, and recovered as part of it. If they are in favour of the defendant, they are recovered as a judgment in his favour; and any party may have, if he chooses, his own attorney's or solicitor's bill taxed by the same officer before paying it, or even after payment in certain cases.

In criminal cases, the prosecutor's C. may be allowed by the judge, and in that case are paid out of the county rates, the county being reimbursed by the Treasury.

In Chancery suits, C. are, in the discretion of the court, given as a general rule to the successful party; but when the suit was properly instituted, and was of the nature of an administrative suit, C. are often given out of the estate.

C., in Scotland, are called Expenses (q. v.). See also AUDITOR OF THE COURT OF SESSION.

**COSTU'ME** (Ital. *costume;* Fr. *coustume, coutume*, from Lat. *consuetudo*, use and wont) is another form of the word custom, and, in its wider sense, signifies the external appearance which the life of a people presents at a particular epoch of its history. In its narrower and more usual sense, C. signifies the customary modes of clothing and adorning the person, in any particular age or country. In this sense, it includes the prevailing fashion in jewellery, weapons, and other personal equipments. In both senses, C. plays an important part in art. The poet, more especially the narrative or epic poet, is compelled to resort to it as a means of carrying his reader back into the age which he describes. Homer has it constantly in view in narrating the exploits of his heroes. Amongst modern romance writers, Sir Walter Scott has introduced the fashion of perhaps an excessive attention to mere external costume. But it is in art as presented to the eye, that C. becomes indispensable, and the loose and general treatment of it which is permitted to the novelist or the poet, is forbidden to the painter, the sculptor, and the player. How sorely the sculptor has been tried by the wigs and breeches of former generations, and by the trousers, straps, hats, and other monstrosities of our own, no one who has seen a statue of Frederick the Great, or of the late Sir Robert Peel, can require to be told. Two means, not of solving but of escaping from the difficulty, have been largely resorted to: the one consists in departing from the modern dress altogether, and reverting to the ancient toga; the other, in wrapping up the figure, as far as possible, in a cloak. The first of these devices is neither more nor less than a deliberate violation of what artists regard as the laws of C., by which they conceive themselves bound to represent every object with its appropriate accessories; the second, besides being very often open in a lesser degree to the same objection, has the further disadvantage of accomplishing its object very imperfectly. The wisest course for the artist is boldly to face the difficulty. That he may do so successfully, many of the works of Rauch, Tieck, Thorwaldsen, Schadow, and others abundantly testify. In the earlier stages of art, an excessive attention to C. may generally be remarked, which though useless, and sometimes hurtful to artistic effect, has proved of the greatest value for historical purposes. The tendency of the earlier schools of art to exhibit C. with an almost painful accuracy and minuteness, is exhibited in the works of the older masters, both of the Italian and German schools. Even during the period of the highest bloom of Italian art, the medieval custom of representing historical, sacred, and ideal characters in the C. peculiar to the time and country of the artist, was in a great measure adhered to. From Paul Veronese, Tintoretto, and others, we may learn the aspect which a marriage-feast in the palace of a Venetian or Florentine grandee presented, but can form little conception of the C. of that simpler festivity in Cana of Galilee, or of that supper still less sensuous in Jerusalem, which they profess to represent. In the hands of the greater masters, these scenes assumed an ideal character; and in the works of Michael Angelo, Leonardo, and Raphael, C., though still exhibiting something of a native trace, rises into the highest regions of poetical conception. The effort to avoid anachronisms by a previous historical and antiquarian study of the subject, belongs, indeed, almost entirely to the modern European schools of art, and many painters of late have devoted themselves to it to such an extent as almost to forget that it is a means, and not an end, except, indeed, to a mere painter of clothes.

But it is in theatrical representations that attention to C., particularly in its narrower sense, becomes most imperative. When the stage, in Western Europe, commenced in the religious mysteries of the middle ages, the dress adopted was that which belonged to the time and the country. To this dress some fantastical object was generally added to indicate the character intended to be personated. In this position matters remained during the time of Shakspeare in England, of Lope de Vega and Calderon in Spain, and even of Corneille, Racine, and Molière in France. Whether a Greek, a Roman, an Assyrian, or a Turk was represented, the ordinary court-dress of the time was adhered to, and the turban, the helmet, or the laurel-crown was placed on the top of the peruke or the powdered hair. In like manner, shepherdesses and peasant-girls had their hair dressed in turrets like feudal keeps, and long white kid-gloves which covered their hands and arms to the elbow. Towards the middle of the 18th c., a reform was introduced by the famous actress Clairon, who acted Electra without hairpowder; but Talma was the first who introduced a C. really true to history. Garrick followed in the footsteps of the great Frenchman, though both he and Siddons, during their earlier period, personated the characters of Shakspeare in what has been called the rococo C.—knee-breeches and periwigs. Schlegel's *Hermann*, and Goethe's *Götz von Berlichingen*, were the first plays which were given in Germany with historical costume.

**CO'STUS, or COSTUS ARA'BICUS**, an aromatic much esteemed by the ancients, and concerning which great doubt long existed, but which seems now to be ascertained to be the dried root of *Aucklandia Costus*, a plant of the natural order *Compositæ*, sub-order *Cynarocephalæ*. It is a native of the moist open slopes surrounding the valley of Cashmere. The roots are there burned as incense. They have a strong aromatic pungent odour, and are employed in protecting bales of shawls from moths.

**CO'SWAY**, RICHARD, a very noted painter in his day, was born at Tiverton, Devonshire, in 1740. He early displayed a taste for painting, and between his 14th and 24th year carried off five premiums from the Society of Arts. As a miniature-painter, he was particularly famous, and gained all the patronage of the nobility of his time. His works, in fact, were the fashion, and all attempts at rivalry were useless. Many of them were distinguished by great delicacy, correctness, and beauty, and his drawings were not unworthy of a place beside some of the old masters. The immense sums of money which he made enabled him to live in the most sumptuous style, and to give musical-parties (his wife on such occasions being the principal performer), so far surpassing all other efforts of the kind that they formed a feature of the time, and were attended by all the rank, fashion, and intellect of that day. C. died in 1821.

**COT**, on shipboard, is an officer's hammock. It is made of canvas, in the form of a kind of chest, six feet long, two and a half wide, and one deep. This receptacle is kept out at full length by means of a square wooden frame. The bed or mattress is placed within the C.; and the arrangement is more comfortable than that of a sailor's hammock; but both are alike slung from the rafters or beams of the cabin.

**CÔTE-D'OR**, a department in the east of France, formed of part of the old province of Burgundy, in lat. 46° 55′—48° 10′ N., long. 4° 2′—5° 30′ E. It has an area of 3350 square miles, with a population, in 1856, of 385,131. The surface is in general rather elevated, and is traversed by a chain of hills forming the connecting-link between the Cevennes and the Vosges. A portion of that range, called the Côte-d'Or ('golden slope'), receives its name (which it gives to the department) on account of the excellence of the wines produced on its declivities. See BURGUNDY WINES. A great part of the department is covered with forests. The valleys and plains are fertile, and there is good pasture-land; but agriculture is in a backward state. C. is watered by the Seine, which rises in the north-west, and by several of its affluents; by the Saone, and by the Arroux, a tributary of the Loire. By means of canals, C. has water-communication with the German Ocean, Mediterranean, English Channel, and Bay of Biscay. The climate is temperate; iron, coal, marble, gypsum, and lithographic stones are found, the first in large quantities. C. is divided into four arrondissements; viz., Beaune, Châtillon-sur-Seine, Dijon, and Semur, with Dijon for a capital.

**COTES**, ROGER, a scientific man of much promise, was born at Burbage, near Leicester, July 10, 1682; but death cut him off on the high-road to fame ere he had attained his thirty-fourth year; not, however, before he had left some marks of his presence in the history of exact science. He was the author of the admirable preface explaining the Newtonian philosophy, and answering objections to gravitation, which was prefixed to the second edition (1713) of Newton's *Principia*. Various mathematical papers of his own, tending greatly to the development of logarithms, were published after his death. Short as his life was, his influence on mathematics is clearly traceable. He was held in the highest esteem by the scholars and scientific men of his time; and Sir Isaac Newton is asserted to have said of him that, had he lived, 'we should have known something.'

**CÔTES-DU-NORD** (northern coasts), a department in the north-west of France, forming a part of Bretagne, and bounded N. by the English Channel, in which are several small islands belonging to C.; lat. 48° 3′—48° 57′ N., long. 1° 53′—3° 35′ W.; area, 2840 square miles; pop. 621,573. The Armoric Hills, called also the Montagnes Noires, and the Menez Mountains, cross the department from east to west. They have a breadth of about sixteen miles, and consist chiefly of granite and clay-slate. These formations give a rude and broken aspect to the coasts. The chief rivers, which are short but navigable, are the Rance, Gouet, Trieux, Guer, and Arguenon. The southern district has the advantage of a considerable length of the canal between Nantes and Brest. Though a great portion of the south and the higher plains is occupied by heath and woods, there are, here and there, fertile spots; and in the north the influence of the neighbouring sea is favourable to vegetation. The cultivation of flax and hemp, with pasturage and iron-mining, supply employment in the mountainous districts; while in the sheltered valleys and on the coast-levels all European kinds of grain, with pears and apples and other fruits, are produced; and maize is cultivated, but does not always ripen. The coasts are well supplied with various kinds of fish. The department is divided into the five arrondissements of St Brieuc, Dinan, Loudéac, Lannion, and Guingamp. The chief town is St Brieuc.

**CO′TESWOLD**, or **COTSWOLD HILLS**, a range of oolitic and lias hills, running through the middle of Gloucestershire, from Chipping Camden in the north-east, by Cheltenham and Stroud, to near Bath in the south-west. They are parallel to the Avon and Severn, and separate the Lower Severn from the sources of the Thames. They are 54 miles long, and in some parts 8 broad, and cover 312 square miles, with an average height of 500 to 600 feet. The highest points are Cleave Hill, 1134 feet, and Broadway Hill, 1086 feet. The soil is a clayey loam, with gravel and stone-brash. The surface is generally bare, with little wood; corn, turnips, and sanfoin are grown, and coarse-woolled sheep fed on them. At Stroud, they are crossed by the Thames and Severn Canal, and the Swindon Junction Railway.

**COTHU′RNUS.** See Buskin.

**COTICE**, or **COST**, in Heraldry, one of the diminutives of the Bend (q. v.). The C. is the fourth part of the bend, and is usually borne in couples, with a head between them.

**COTICÉ**, the French term to express that an escutcheon is divided bendways into many equal parts. See Bendy. In English heraldry, anything that is accosted, sided, or accompanied by another heraldic object, is said to be cotised.

**COTI′LLON** (Fr. under-petticoat), the name of a brisk dance, of French origin, performed by eight persons. It was common in Scotland at the end of the last and beginning of the present century, continuing fashionable till superseded by the quadrille, which is only a new variety of the cotillon.

**COTINGA** (*Ampelis*), a genus of birds of the family *Ampelidæ*, or Chatterers (q. v.), having a rather feeble and deeply-cleft bill, and feeding both on insects and fruits. They are natives of South America, inhabit moist places, and are remarkable for the splendour of the plumage of the males during the breeding-season. Azure and purple are then their prevalent colours. During the rest of the year, they are clothed in a tame gray or brown.

**COTOPA′XI**, one of the loftiest of the active volcanoes of the Andes, is situated in the Eastern Cordillera of that colossal range, its lat. and long. being 0° 41′ S., and 78° 42′ W. The summit is 18,887 feet above the sea, or about 9800 feet above the table-land of Quito. The upper part, a perfect cone of 4400 feet in height, is entirely covered with snow, excepting that the immediate verge of the crater looks more like a bare parapet of rock. Humboldt, who attempted to ascend the mountain in 1802, found great difficulty in reaching even the snowy zone, and pronounced the top itself to be absolutely inaccessible. The scoriæ cover the neighbouring valleys; the flames have been known to rise 3000 feet; and the roaring of the eruption has sometimes been heard at the distance of 200 leagues.

**COTRO′NÉ**, a town of Naples, in the province of Calabria Ultra II., built on a point of land projecting into the sea, in lat. 39° 7′ N., long. 17° 10′ E. It is almost surrounded by the Esaro (ancient Æsarus), which here has its embouchure. C. is very strongly fortified. Its streets are dark and narrow, and its port of no importance; pop. about 5000. C., however, possesses interest from its antiquity and its historic associations. It owes its origin to a colony of Achæans, as far back as 710 B.C., its ancient name being Croton or Crotona. It soon became prosperous, wealthy, and powerful. Its walls measured 12 miles in circumference, and the territory over which it extended its sway was considerable. Its inhabitants were celebrated for athletic exercises, and they carried off most of the prizes at the Olympic games. Milo was its most renowned athlete. Pythagoras settled here about the middle of the 6th c. B.C.; but the influence which, by means of a league of his formation, he exercised, became obnoxious to the citizens, and he was expelled. About 510 B.C., C. sent forth an army of above 100,000 men to fight the Sybarites, who were utterly defeated, and their city destroyed. The war with Pyrrhus completely ruined the importance of C., and in the 2d c. B.C. it had sunk so low, that a colony of Romans had to be sent to recruit its well-nigh exhausted population. It never afterwards recovered its prosperity. Some ruins belonging to the old, exist in the vicinity of the modern city, the most important of which is a Doric column, part of a once magnificent temple to Juno, on Cape Colonne or Nau (the Naus of the ancients).

**COTTA**, the name of a very old German publishing-house, established at Tübingen in 1649, and still one of the most flourishing in Germany. The family came from Italy about the beginning of the 15th century. Its most prominent member was Joh. Friedr., Freiherr von C., a meritorious theologian of the 18th century.

Joh. Friedr., Freiherr von C., one of the most eminent publishers that Germany ever produced, was born at Stuttgart, 27th April 1764. He was educated at the university of Tübingen, and for some time practised as an advocate. In 1787, he undertook to conduct the family book-trade at Tübingen; and in 1795 established the *Horen*, a literary journal, under the editorship of Schiller. In the same year, he commenced two larger periodicals, the *Politischen Annalen*, and the *Jahrbücher der Baukunde*. In 1798, he established the *Allgemeine Zeitung*—still published at Augsburg—the *Almanach für Damen*, and other works of a similar kind. C. now began to publish the works of the illustrious modern authors of Germany, such as Goethe, Herder, Fichte, Schelling, Jean Paul, Tieck, Voss, Therese Huber, Matthisson, the Humboldts, Joh. von Müller, and Spittler. Besides the periodicals already mentioned, C. established the *Morgenblatt* and the *Literaturblatt*, and carried on the

*Kunstblatt*, founded by Schorn. In 1810, he went to live at Stuttgart. The nobility of his family, which dated far back, was confirmed in his person under the title of Freiherr C. von Cottendorf. In 1824, he introduced the first steam-press into Bavaria, and, shortly after, founded at Munich the Literary and Artistic Institute. He died 29th December 1832. C.'s political principles were liberal, but temperate. In the diet of Würtemberg, and afterwards as president of the Second Chamber, he was always the fearless defender of constitutional rights. In manners, C. was simple and pure; and although covered with titles and orders from different governments, he had neither the pride nor the selfishness of a hereditary patrician. The first Würtemberg proprietor who abolished servitude on his estates, C. also furthered the interests of his farmers by building model-farms, and by setting an example in all rural improvements.

**CO'TTAGE**, a small dwelling-house, detached from other buildings, and usually of one story in height. Originally applied to a humble order of dwellings in the country, the term C. now embraces a wide variety of structures, from the cottage *orné* of the French, to the simple but not unattractive cabin in the English rural districts, and the mountain *chalet* of Switzerland. In England, where universal security enables the people to establish dwellings in retired and picturesque situations, the building of cottages has been brought to great perfection; and it may be said with truth, that in no country in the world are there to be seen such a variety of beautiful cottages, scrupulously clean and neat in the interior, and ornamental exteriorly with flowers, shrubs, and bright green lawns. The different styles in which this class of houses may be built, are well described in the elaborate work of J. C. Loudon, on *Cottage Architecture.* The subject of proper C. accommodation, as regards the labouring peasantry of England and Scotland, has lately engaged serious attention. See papers in the *Transactions of the National Association for the Promotion of Social Science.* The best methods of keeping cows, pigs, poultry, bees, &c., are ordinarily described under the comprehensive title of C. economy. See Cobbett's *Cottage Economy,* also *Chambers's Information for the People.*

**CO'TTBUS**, or **KO'TTBUS**, a town of Prussia, in the province of Brandenburg, situated on the Spree, about 70 miles south-east of Berlin. It is an ancient place, surrounded by walls, and it has an old castle with towers, a royal palace, a gymnasium, and manufactures of beer, woollens, linen, leather, and tobacco. Pop. about 8500.

**COTTIN**, SOPHIE, a very popular French authoress, was born at Tonneins (Lot-et-Garonne) in 1773. Her maiden name was Ristaud. Educated at Bordeaux, she was married when only 17 to M. Cottin, a Parisian banker, who left her a widow at the age of 20. From an early period she had exhibited a love of literature; and to cheer the solitude of her affliction (for she had no children), she now betook herself to the composition of verses, and even ventured on a lengthy history. But it was in fiction she was destined to win unfading laurels. In 1798, appeared *Claire d'Albe;* in 1800, *Malvina;* in 1802, *Amélie Mansfield;* in 1805, *Mathilde;* and in 1806, *Elisabeth, ou les Exilés de Sibérie,* a work which has been translated into most European languages, and has always been extraordinarily popular with the young. Madame C. died 25th August 1807.

**CO'TTON**, an important vegetable fibre, extensively cultivated in various parts of the globe within the 35th parallels of latitude.

1. *Botanical and Commercial Classifications.*—C. is the produce of all the species of the genus *Gossypium,* which belongs to the natural order *Malvaceæ,* and is thus allied to Mallow, Hollyhock, Hibiscus, &c., the general resemblance to which is very apparent both in the foliage and flowers. The species are partly shrubs, partly herbaceous, and either perennial or annual; they are natives of the tropical parts of Asia, Africa, and America, but their cultivation has extended far into the temperate zones. They all have leaves with three to five lobes, which in a very young state are often sprinkled with black points, and rather large flowers, which are mostly yellow, but sometimes in whole or in part purple; the flowers very soon fall off; they grow singly from the axils of the leaves, and are surrounded at the base by three large, heart-shaped, cut or toothed, involucral leaves or bracts, partially growing together as one. The fruit is a 3—5-celled capsule, springing open when ripe by 3—5 valves, and containing numerous seeds enveloped in C., which is generally white, but sometimes yellow, and issues elastically from the capsule after it has burst open. The figure represents a species of C. plant found in India, and shews the manner in which the C. escapes from the capsule. Some of the other kinds have the flowers larger in proportion, and the leaves divided into more numerous and much deeper and narrower lobes, but the general appearance of all is very similar. Difference of opinion exists among botanists as to the number of distinct species, and there are very many varieties in cultivation, the number of which, through climatic influences and other causes, is continually increasing; but there are certain leading peculiarities on account of which some botanists and practical farmers reduce all, at least of the cultivated kinds, to four primary species—viz., 1. *Gossypium Barbadense;* 2. *G. Herbaceum* or *Indicum;* 3. *G. Peruvianum;* and 4. *G. Arboreum.* The produce of the first species is the most valuable. The beautiful long-stapled silky wool known as 'Sea Island' is a variety, and is grown exclusively upon the islands and a

Cotton (*Gossypium tricuspidatum*).

portion of the mainland of Georgia, South Carolina, and Florida; the saline ingredients of the soil and atmosphere being indispensable elements of the growth. The plant bears a yellow flower, and the seeds are small, black, and quite smooth, and the wool is easily separated therefrom; but when sown far inland, away from the saline influences of the coast, the seeds increase in size, and become covered with innumerable short hairs. A large percentage of the crops raised in Alabama, Louisiana, Mississippi, Texas, &c., are also varieties of this species, though, owing to climatic influences, the wool is shorter in staple, and less easily separated from the seeds than Sea Island. The commercial value of the latter kind varies from 1*s.* to 3*s.* per lb., rare specimens sometimes realising 5*s.* or 6*s.* per lb. The short-staple varieties, known as New Orleans, Mobile, &c., sell at from 4*d.* to 9*d.*, extra qualities sometimes bringing 1*s.* per lb. *G. herbaceum* is found in India, China, Egypt, &c. The principal commercial varieties are those known as Surat, Madras, and short-stapled Egyptian. It is a small shrubby plant, bears a yellow flower, the seeds are covered with short grayish down, and the staple produced, though not long, is very fine. Its price varies from 3*d.* to 6*d.* per lb. A variety is cultivated in the United States, and the C. known as nankeen is thought to belong to this species. *G. herbaceum* can be profitably cultivated in colder countries than any other species of C. plant. The third species is a native of South America, and the 'green seed' C. of the United States appears to be a variety. The stem reaches 10 to 15 feet in height, the flowers are yellow, and the capsules contain eight or ten black seeds firmly attached together in a cone-like mass. The wool is long and strong-stapled, and in value stands next in order to Sea Island and long-stapled Egyptian. Maranham, Bahia, and Maceio are varieties which sell in Liverpool at from 7*d.* to 1*s.* 2*d.* per lb. *G. arboreum* is found in India, China, &c., and, as its name imports, is a large tree-like plant. It bears a red flower, and produces a fine yellowish-white wool. Varieties of it have been long cultivated in the United States, and with the requisite soil and climate, are said to produce a wool somewhat resembling Sea Island.

2. *Cultivation.*—The plant is a very delicate organism, and requires a peculiar soil and climate for its due development. The method of cultivation is much the same in the various countries where the fibre is grown; but the most perfect system is that which obtains in the United States of America. Although the plant is not strictly speaking an annual, it is found more profitable to destroy the shrub, after the crop is gathered, and sow new plants every year. The preparation of the land takes place during the winter-months. After the ground has been thoroughly ploughed, and as soon as all symptoms of frost have disappeared, the soil is thrown up into ridges varying in width from 2 to 5 or 6 feet, according to the situation and quality of the soil. The seed is then sown along the centre of the ridges, in holes from 12 to 18 inches apart. The sowing commences in March, and generally continues through April; but sometimes, owing to late spring frosts, the planting is prolonged to May. The young shoot appears above ground in about five or six days, and is then and subsequently weeded and thinned, until finally there remain only from two to four plants in each hole. Later on, these are topped a few inches, in order to promote the growth of bolls. Blooming takes place about the beginning of June—in early seasons, towards the latter end of May: the average date of the past 35 years is June 5. As a general rule, C. is a dry-weather plant. For ploughing, the farmer requires just sufficient rain to give the soil a moist and spongy texture. During the early stages of its growth, the crop flourishes best with a warm steamy sort of weather, with an occasional shower until blooming; too much rain being productive of weeds and wood at the expense of wool, whilst a severe drought produces a stunted plant, forced into too early maturity, and resulting in a small and light-stapled crop. A great deal, however, depends upon the position of the plantation; lands situated in hilly or upland districts obviously requiring more moisture than those lying in the plains and river-bottoms. From the date of blooming to the close of the picking-season, warm dry weather is essential. Picking generally commences in August, occasionally in July, and continues until the occurrence of frost—about the end of October or beginning of November—puts a stop to the further growth of the plant. All the available hands of the plantation, young and old, are called into full employment during the harvest. The C. is gathered into baskets or bags suspended from the shoulders of the pickers, and when the crop has been secured, it is spread out and dried, and then separated from the seeds. The latter process was formerly performed by hand—a tedious operation, by which one hand could clean only a pound or so a day; but since the invention of the saw-gin, by Eli Whitney in 1793, the process of cleaning has been both rapid and effectual. This machine is composed of a hopper, having one side formed of strong parallel wires placed so close together as to exclude the passage of the seeds from within. The wool is dragged through the apertures by means of circular-saws attached to a large roller, and made to revolve between the wires, the seeds sinking to the bottom of the hopper. This process is adopted only in cleaning the short-stapled varieties of American C., the seeds of which adhere so firmly to the wool as to require a considerable amount of force to separate them. The Sea Island variety is cleaned by being passed through two small rollers, which revolve in opposite directions, and easily throw off the hard smooth seeds. In India, though the saw-gin has been introduced in some districts, the wool is mostly cleaned by means of the primitive roller. Both descriptions of gins are used in Egypt and the Brazils. The C. cleaned by the roller-gin, being uninjured thereby in staple, realises the better price; but the deterioration caused by the saw-gin is compensated for by the greatly increased quantity cleaned; the latter turning out four or five times as much work as the former in an equal space of time, and thereby considerably reducing the expense of cleaning.

3. *Production and Distribution.*—The oldest C.-producing country is India, in which empire the plant has been grown and manufactured from time immemorial. Early mention is also made of it in the annals of Egypt, and it is believed to have a high antiquity in all parts of Africa. In the western world, it was found by Columbus, but was not so extensively cultivated as in the east; though during the past half-century the culture there has outstripped, both in quantity and quality, the produce of the Old World. Down to the commencement of the present century, the C. consumers of Europe were dependent upon the East and West Indies and the Levant for their raw material; but the inventive genius, superior farming, and greater energy of the planters of the southern states of America, have almost secured the monopoly of supplying the manufactures of Great Britain and the European continent with this valuable fibre. We will glance briefly at the history of the trade of the chief C.-growing countries.

*United States.*—The introduction of the plant is traced as far back as 1536, but the export-trade did not commence until two and a half centuries later, the first shipment of importance being about 2000 lbs. in 1770. In 1791, the amount reached 189,316 lbs. In 1793, the invention of the saw-gin gave a new stimulus to the trade, and in 1800, the exports reached 17,789,803 lbs.; from which period the shipments have continued to increase, being over 124,000,000 lbs. in 1821, 277,000,000 lbs. in 1831, 530,000,000 lbs. in 1841, 927,000,000 lbs. in 1851, and about 2,160,000,000 lbs. in 1860. Simultaneously with this rapid increase in production, there has been a gradual decline in the price of the wool, in consequence of improved processes of cultivation and cleaning, and the cheapening of carriage, &c.; the average price in Liverpool, in 1793, being 1*s.* 6*d.* per lb.; in 1801, 2*s.* 2*d.*; in 1811, 1*s.* 2*d.*; in 1821, 9½*d.*; in 1831, 6*d.*; in 1841, 6¼*d.*; in 1851, 5¾*d.* per lb.; from which period, however, the downward course has not only been checked, but prices have considerably advanced; the average for 1857 being 7¼*d.* per lb., and for 1860, about 6½*d.* to 6¾*d.* per lb. This altered state of things is owing to the fact that, since 1845, consumption has been a long way ahead of production. The stocks at the close of the year just named reached probably 1,500,000 bales, whilst, at the end of 1859, they were only half that quantity, consumption in the meantime having doubled. The following table gives the

AMOUNT AND VALUE OF THE LAST TEN AMERICAN CROPS.

| Seasons. | Number of Bales, including Cotton taken for Consumption direct from the Plantation. | Computed weight in lbs. | Average export price. | Value. |
|---|---|---|---|---|
| | | | Cents. | £ |
| 1850—51 | 2,415,257 | 1,016,484,225 | 12·11 | 25,645,049 |
| 1851—52 | 3,090,029 | 1,291,632,122 | 8·05 | 21,661,747 |
| 1852—53 | 3,352,882 | 1,424,974,850 | 9·85 | 29,241,671 |
| 1853—54 | 3,035,028 | 1,304,061,610 | 9·47 | 25,747,778 |
| 1854—55 | 2,932,339 | 1,237,447,058 | 8·74 | 22,531,889 |
| 1855—56 | 3,645,345 | 1,622,178,525 | 9·47 | 32,004,230 |
| 1856—57 | 3,056,519 | 1,354,037,917 | 12·75 | 35,966,590 |
| 1857—58 | 3,238,962 | 1,457,532,900 | 11·50 | 34,920,059 |
| 1858—59 | 3,994,481 | 1,789,427,488 | 11·60 | 43,140,330 |
| 1859—60 | 4,829,770 | 2,158,907,190 | 10·75 | 48,350,525 |

STATEMENT OF THE PRODUCTION, DISTRIBUTION, AND AVERAGE PRICE OF THE LAST THIRTY-FIVE CROPS OF AMERICAN COTTON, ACTUAL AND PROPORTIONAL, IN AVERAGE PERIODS OF FIVE YEARS EACH (EXPRESSED IN THOUSANDS OF BALES).

| Periods of Five Years. | Average Produce of | | | | | | Average Total Crop. | Proportional Produce of | | | | | | Average Exports to | | | | Average Consumption of U.S. (*N. of Virginia only*). | Average Stock at close of Season. | Total Average Deliveries. | Proportional Distribution of Total Average Deliveries. | | | | Average Price p. lb. of Whole Crop. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Georgia *via* Savannah. | S. Carolina *via* Charleston. | N. Carolina and Virginia. | Florida *via* Apalachicola, &c. | Alabama *via* Mobile. | Louisiana, Miss. Ark., Tennessee, and Texas. | | Georgia. | S. Carolina. | N. Carolina and Virginia. | Florida. | Alabama. | Louisiana, &c. | Great Britain. | France. | Other Foreign Ports. | Total. | | | | Great Britain. | France. | Other Foreign Ports. | Consumption of United States. | Five Years. | Last Year. |
| | (1) | (2) | (3) | (4) | (5) | (6) | | | | | | | | | | | | | | | | | | | | |
| 1826—30 | 216 | 152 | 91 | 4 | 84 | 302 | 849 | 25½ | 17⅞ | 10¾ | ½ | 9⅞ | 35½ | 539 | 173 | 46 | 758 | 114 | 35 | 872 | 61⅞ | 19⅞ | 5¼ | 13 | 10¼ | 9½ |
| 1831—35 | 252 | 194 | 69 | 29 | 143 | 424 | 1111 | 22⅝ | 17½ | 6¼ | 2¾ | 12⅞ | 38¼ | 673 | 202 | 41 | 916 | 193 | 56 | 1109 | 60⅝ | 18¼ | 3¾ | 17⅜ | 11⅜ | 16 3/16 |
| 1836—40 | 267 | 249 | 44 | 96 | 295 | 673 | 1624 | 16⅝ | 15⅜ | 2¾ | 5⅞ | 18¼ | 41⅜ | 966 | 308 | 88 | 1362 | 255 | 54 | 1617 | 59¾ | 19 | 5½ | 15¾ | 12⅜ | 8 1/16 |
| 1841—45 | 246 | 314 | 28 | 141 | 421 | 874 | 2024 | 12¼ | 15⅝ | 1⅜ | 7 | 20⅞ | 43¼ | 1181 | 347 | 172 | 1700 | 325 | 91 | 2025 | 58⅜ | 17⅛ | 8½ | 16 | 7⅝ | 5 15/16 |
| 1846—50 | 285 | 341 | 21 | 161 | 410 | 993 | 2211 | 12⅞ | 15½ | 1 | 7¼ | 18⅜ | 44⅞ | 1180 | 308 | 229 | 1717 | 477 | 163 | 2194 | 53¾ | 14 | 10½ | 21¾ | 8½ | 11 |
| 1851—55 | 338 | 449 | 42 | 168 | 508 | 1377 | 2882 | 11¾ | 15½ | 1⅛ | 5⅞ | 17⅝ | 47¾ | 1595 | 387 | 323 | 2305 | 576 | 126 | 2881 | 55⅜ | 13½ | 11⅛ | 20 | 9⅝ | 8¾ |
| 1856—60 | 400 | 458 | 63 | 154 | 646 | 1900 | 3621 | 12⅝ | 11 | 1¾ | 4¼ | 17⅞ | 52½ | 1970 | 464 | 485 | 2919 | 678 | 119 | 3597 | 54¾ | 12⅞ | 13½ | 18⅞ | 11¼ | 10¾ |

(1). The bulk of the crops of Georgia are shipped at Savannah, but a considerable portion goes down to the port of Apalachicola. (2). The crops of South Carolina are received at Charleston. (3). The great decrease which has taken place in the production of North Carolina and Virginia is owing principally to the transference of a large number of their labourers to the more fertile lands of the south and west; and to the abandonment of the culture of C. for tobacco and other growths. The yield per acre of these states is barely half that of the lands in the Mississippi Valley. (4). The Floridian crops are shipped at Apalachicola, St Marks, &c. Portions of the crops of Georgia and Alabama are also received at the former port. (5). Nearly the whole of the harvests of Alabama are received at Mobile; a quantity of C. grown in Mississippi also finds its way there. (6). This column includes the C. shipped from New Orleans and Galveston, and that received overland from Tennessee, &c., to Philadelphia, Boston, Baltimore, &c. The crops of North Alabama are also received at New Orleans.

*East Indies.*—After the United States, the most extensive C.-producing country is India. The plant is indigenous to the soil, and the culture and manufacture have existed from prehistoric times. A century ago, the western world was almost entirely dependent upon the east for its C. goods, but within the past one hundred years the order of things has been almost reversed. The mills of Lancashire are now in successful competition with the famed looms of India, and the natives of that vast empire find it cheaper to take our calicoes in exchange for their raw C., than it is to manufacture their own clothing. The first import of East Indian C. into Great Britain took place in 1783. The average receipts, from that year to 1792, were 65,550 lbs.; from 1793 to 1800, 2,223,039 lbs.; 1801 to 1810, 6,357,000 lbs.; 1811 to 1820, 24,016,805 lbs.; 1821 to 1830, 18,835,567 lbs.; 1841 to 1850, 79,815,403 lbs.; and 1851 to 1859, 23,017,310 lbs. In 1820, only 224 pounds-weight of C.-yarn, and 14,191,177 yards of goods, were exported to India; but in 1859, the figures were 44,006,352 lbs. yarn, and 968,016,350 yards of calico! It is impossible to ascertain the total amount of C. raised in India; but seeing that the fibre is grown all over the peninsula, and used for all the purposes for which we employ C., flax, wool, and mostly hemp—the amount must be equal to, if not over that of the United States. Of the export-trade we can speak more positively, and the above and following figures will give the reader some idea of the extent of this branch of Indian commerce:

EXPORT OF COTTON-WOOL FROM INDIA TO

| Years. | Great Britain. | China. | Other Parts. | Total. |
|---|---|---|---|---|
| | lbs. | lbs. | lbs. | lbs. |
| 1850—51 | 141,446,798 | 77,050,629 | 7,976,256 | 226,473,683 |
| 1851—52 | 81,104,223 | 160,717,651 | 1,630,957 | 243,452,831 |
| 1852—53 | 181,360,994 | 75,671,742 | 5,875,437 | 262,908,173 |
| 1853—54 | 138,183,429 | 55,777,008 | 3,801,328 | 197,761,765 |
| 1854—55 | 119,513,537 | 45,893,923 | 8,372,732 | 173,780,192 |
| 1855—56 | 170,771,510 | 56,691,112 | 9,717,327 | 237,179,949 |
| 1856—57 | 253,410,036 | 48,784,561 | 17,458,927 | 319,653,524 |
| 1857—58 | 197,221,247 | 20,524,119 | 42,608,686 | 260,354,052 |

The supply of C. from India has always been merely supplementary to that from the United States. With a small crop in America, prices advance, and the imports from India increase; but with a large American yield, prices droop, and the receipts from India fall off; the surplus produce finding its way to China, or being consumed in the interior. The cause of this unstable character of the Indian trade, is the inferior quality of the staple caused by careless cultivation and adulteration, and the want of suitable roads to the seaboard. A considerable improvement, however, has taken place, in these respects, within the last few years: and many large shipments received during 1860 have compared favourably with the most useful grades of short-stapled American.

*Brazils.*—From the year 1801 to 1810, the Brazils supplied 24·08 per cent. of the C. used in Great Britain; and 31·55 per cent. during the years 1811 to 1820, the increase in the latter period being owing to the American war; but at the present time, the proportion received from that empire is barely 5½ per cent. The difference has been owing not so much to any actual decrease in the quantity received, though that has been considerable, but to the greater development of the trade of the United States, owing to the superior enterprise of their planters, and to the peculiar nature of the produce of the Brazils, which is only required for the finer grades of yarns. More than three-fourths of the C. grown in the Brazils is shipped to England. The following table shews the average imports of C. from Brazil for the first 59 years of the present century:

| Years. | Imports. Bales. | Proportion of Total Import. |
|---|---|---|
| 1801—10, | 72,509 | 20·08 |
| 1811—20, | 130,234 | 31·55 |
| 1821—30, | 144,052 | 20·69 |
| 1831—40, | 128,110 | 11·33 |
| 1841—50, | 113,320 | 7·16 |
| 1851—59, | 127,711 | 5·45 |

*West Indies.*—During the infancy of the trade, our spinners received 75 per cent. of the C. consumed from the West Indies, and the remainder from the Levant; but since the great expansion of the American branch of the trade, the supplies from the West Indies have gradually fallen off—the planters finding it more profitable to occupy their labour and capital in the production of sugar and other growths. From an average of 80,000 bales at the beginning of the present century, the supply from the West Indies has dwindled down (1859) to 9000.

*Egypt.*—The C. plant has been known in Egypt from time immemorial; but the trade, properly so called, was first introduced by the celebrated Mehemet Ali, about forty years ago. The first exportation took place in 1821, and amounted to 944 bales. During the seven years ending 1827, 1,011,697 bales were produced, or 144,528 bales per annum. In the next septennial period, there was a falling off, owing to the withdrawal of a large number of labourers to carry on the wars of the pasha in Soudan, &c., and Syria; the exports therefore only reached 900,521 bales, or 128,646 per year. The transactions of the subsequent seven years shew a considerable improvement, the total shipments being 1,498,042 bales, and the annual average 214,006 bales. During the years 1842—1848, the total rose to 1,549,909 bales, being an annual average of 221,415 bales. Since then, the trade has continued to augment, and the average shipments of the years 1849—1859 were 473,282 bales. Great Britain is the principal consumer of Egyptian C., after which comes Austria, then France. The following figures shew the destination of the C. exported from Alexandria during the five years ending 1859:

EXPORTS TO

| Years. | England. | France. | Austria. | Other Countries. | Total. |
|---|---|---|---|---|---|
| 1855 | 270,615 | 108,248 | 140,412 | 1611 | 520,886 Bales. |
| 1856 | 322,548 | 94,702 | 121,863 | 722 | 539,835 〃 |
| 1857 | 284,440 | 109,850 | 94,351 | 2319 | 490,960 〃 |
| 1858 | 307,541 | 103,500 | 108,496 | ... | 519,537 〃 |
| 1859 | 325,475 | 98,672 | 78,372 | 126 | 502,645 〃 |

*Other Countries.*—In addition to the districts just passed in review, C. is grown in numerous other countries. The increasing requirements of the trade, and the fact that our spinners are dependent upon one source for three-fourths of the raw material necessary for the stability of the manufacture, stamps the question of C. supply with great importance. As things at present stand, and as they have stood for some time past, the planters of America virtually monopolise the function of supplying the manufacturers of Europe with raw cotton. Prices of all descriptions are ruled by the supply from the United States. A large crop in America will tend to reduce not only the price of American C., but likewise the value of the produce of all other countries; whilst a larger import than usual from other districts will not affect the value of American C. at all. This, together with the certainty that the United States will yearly require an increasing proportion of their C. for home-consumption, has been the cause of the great efforts which have been made during the last two or three years to increase the supply of good useful C. from other countries than the American Union. To give stability to prices, or, at all events, to do away with the wide and injurious fluctuations which sometimes take place, the proportional imports from America would require to be reduced at least one-half. The first practical operation in this direction was made by Mr Thomas Clegg, of Manchester, some ten years ago, when that gentleman established a native agency for the purchase of C. on the west coast of Africa. During the year 1852, Mr Clegg imported in this way 1810 lbs. of C.; in 1853, 4617 lbs.; in 1857, 35,419 lbs.; and in 1859, 70,000 lbs. The success of Mr Clegg's enterprise, together with the discoveries of Dr Livingstone, prove that Africa is capable of producing a wool equal in quantity and quality to that of the great Republic. The next great movement was the formation of the 'Cotton Supply Association,' in 1857. The energies of this society have been engaged not in growing C., but (1) in supplying seeds, machines, and instruction to those willing to engage in the cultivation; and (2) in ascertaining the capabilities and peculiarities of the various districts of the world where the plant may be, but is not at present produced, for export. The success of the Association during the three years of its existence has been considerable. Its correspondence embraces every district of the C. zone, and by its instrumentality alone, the wants of English spinners have been made known throughout the tropics. By reference to the last report of the committee, we find that seed has been distributed in the following places, and that the natives and residents of each district shew every disposition to engage in the culture: *Turkey in Europe*, *Greece*, *Cyprus*—in which island 80,000 acres of land are said to be about to be placed under cultivation; *Asia Minor*; *Egypt*—renewed exertion; *Tunis*; *Madeira*; *Sierra Leone*—where an English trader has commenced the cultivation, and a native merchant is engaged in cleaning the wool produced in the district; *Sherbro*—where the trade is likewise promising; *Liberia*—the president of which has taken the matter in hand, and by means of prizes, consisting of money, medals, and C.-gins has given considerable interest to the movement; the *Gold Coast*—than which no other district in Africa is more favourable, and from whence C. has been received and sold in Liverpool at 7*d.* to 7½*d.* per lb.; *Elmina, Benin, Old Calabar,* and the *Cameroons; Lagos, Abbeokuta*—from whence the bulk of our African supplies are at present received: the imports from this district in 1859—1860, being 3447 bales against only 1800 in 1858—1859. The African Civilisation Society of New York have established a farm here, and a London Company, for the same purpose, is in formation; the *River Niger*—whence C. has been received worth 6*d.* to 8*d.* per lb., though it can be purchased from the planters, uncleaned, at ½*d.* per lb., or ready cleaned, for 2*d.* or 3*d.* per lb.; *Angola*—the resources of which are being developed by the Portuguese government; *Natal*—where several farms have been commenced, and a shipment of the produce of which has been sold at 9*d.* per lb.; *Cape Colony*—where the reports represent the prospects of the culture as most promising. Reports and samples have also been received from *Cuba, Jamaica, Tobago, Barbadoes,* &c., in the West Indies; from *Peru, Venezuela, British Guiana,* &c., in South America; from *Batavia* and *Java;* from the *Feejee Islands*—whence samples have been received worth 7*d.* to 1*s.* 0½*d.* per lb.; also from *Australia*—the climate of some districts of which is found to be well adapted for the growth of Sea Island C., samples of which have been received worth 3*s.* per lb.; and from *Ceylon, Pegu,* and all parts of *India.* Such is a very brief epitome of what the Association has been doing. But there is still plenty to do, for though the C. trade has passed the stages of infancy, it has not yet arrived at that point of its existence whence it will only progress with the increase of population.

4. *Consumption.*—Our remarks under this head will be confined to Europe and the United States of America. An immense quantity of C. is consumed annually in India (variously estimated between 1,800,000,000 lbs. and 3,000,000,000 lbs.), China, and Africa; but there are no means of ascertaining even an approximation of the amounts so used. It seems to be pretty certain, however, that the consumption of these districts is on the decline, owing to the inability of the native fabrics to compete with the superior and cheaper produce of the spindles and looms of Great Britain, &c., so that whatever the extent of the Eastern spinning-trade may be, it is not likely to materially affect the producing powers of Europe.

*Great Britain.*—The origin of the C. trade of the continent dates as far back as the 10th c., at about which period the staple was introduced into Spain by the Mohammedans. Since that time, the manufacture has continued to expand, more or less, until it has arrived at its present gigantic proportions. Though we have early mention of C. goods in the annals of almost every country of Europe, still the progress of the trade was very slow until within the past one hundred years. Indeed, before the middle of the 18th c., C. goods properly so called were never produced—the fabrics manufactured being a mixture of either C. and linen, or C. and wool, C. yarn being used for weft only. It is from the dates of the patents of Wyatt (spinning by rollers, 1738), Arkwright (water-frame, 1769), Hargreaves (jenny, 1770), Crompton (mule, 1779), and Cartwright (loom, 1785), that the rise of our modern manufacture must be dated. The stimulus given to the trade of our own country by these inventions was instantaneous, and when adopted on the continent, a few years after their utility had been sufficiently proved, similar effects followed there. The following figures will give the reader an idea of the rapid extension of the consumption of C. in Great Britain:

IMPORT OF COTTON WOOL INTO GREAT BRITAIN.

| Year. | American.<br>lbs. | Total of all kinds.<br>lbs. |
|---|---|---|
| 1701, . . . . . | none | 1,976,359 |
| 1751, . . . . . | none | 2,976,610 |
| 1771, one year after Arkwright's loom and Hargreaves' jenny, . . . | none | 4,764,589 |
| 1780, year after Crompton's mule, | none | 6,766,613 |
| 1785, . . . . . | none | 18,400,384 |
| 1791, . . . . . | 189,316 | 31,447,605 |
| 1794, year after the invention of the saw-gin, . | 487,600 | 19,040,929 |
| 1800, . . . . . | | 43,379,278 |
| 1820, . . . . . | 89,999,174 | 151,672,655 |
| 1840, . . . . . | 487,856,504 | 592,488,010 |
| 1859, . . . . | 961,707,264 | 1,225,989,072 |

The following table furnishes particulars of the imports actual and proportional, exports, home consumption, and prices of C. during the past fifty-nine years, in average periods of ten years:

SUPPLY AND CONSUMPTION OF RAW COTTON IN GREAT BRITAIN FROM 1801 TO 1859.

| Average Periods of Ten Years. | Import in Bales, distinguishing the Growth. | | | | | | Proportional Import of each Growth. | | | | | Export. | Home Consumption. | Total Deliveries. | Average Price per lb. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | United States. | Brazil. | Egypt. | West Indies, &c. | East Indies. | Total. | United States. | Brazil. | Egypt. | West Indies, &c. | East Indies. | Bales. | Bales. | Bales. | American.<br>s. d. | Surat.<br>s. d. |
| 1801—10 | 126,788 | 72,509 | ... | 81,129 | 18,584 | 299,010 | 42·48 | 24·08 | ... | 27·09 | 6·35 | 8,390 | 290,610 | 299,000 | 1 8 | 1 3½ |
| 1811—20 | 159,403 | 130,234 | ... | 53,794 | 69,480 | 412,911 | 38·59 | 31·55 | ... | 13·11 | 16·75 | 30,644 | 346,586 | 377,230 | 1 7¼ | 1 2¾ |
| 1821—30 | 435,695 | 144,052 | 35,890 | 26,617 | 53,789 | 696,043 | 62·65 | 20·69 | 5·17 | 3·73 | 7·76 | 65,300 | 630,310 | 695,610 | 0 7 | 0 6⅛ |
| 1831—40 | 817,549 | 128,110 | 31,154 | 22,272 | 130,899 | 1,129,984 | 72·38 | 11·33 | 2·74 | 1·95 | 11·60 | 96,870 | 1,014,300 | 1,111,170 | 0 7¾ | 0 5¾ |
| 1841—50 | 1,190,260 | 113,320 | 51,940 | 13,080 | 209,380 | 1,577,980 | 75·41 | 7·16 | 3·30 | 0·82 | 13·31 | 176,210 | 1,403,520 | 1,579,730 | 0 5⅝ | 0 4 |
| 1851—59 9 years. | 1,688,233 | 127,711 | 106,056 | 9,100 | 417,244 | 2,348,344 | 71·89 | 5·45 | 4·52 | 0·38 | 17·76 | 335,511 | 2,020,488 | 2,355,999 | 0 5 15/16 | 0 4¼ |

The latest factory returns—viz., 1856—state that there were in Great Britain, in that year, 2210 mills, 28,010,217 spindles, and 298,847 looms, and that 379,213 persons were employed in the manufacture. At the present time, the number of spindles is about 30,750,000, and the number of hands employed about 415,000. The various buildings and machines are said to have cost £48,000,000, and it has been calculated that a floating capital of £25,000,000 is employed in carrying on the trade. If we take into consideration the persons employed in the building of the mills and making of the machines, and in the buying and selling of the raw and manufactured material, it will be found that something like '4,000,000 individuals are dependent upon the prosperity of the cotton trade for their livelihood.' The total quantity of yarn exported in 1859 was 192,342,516 lbs., worth £9,465,704; and the total quantity of calicoes, cambrics, fustians, &c., was 2,563,445,393 yards, worth £37,040,127. Besides these, there were £1,702,613 worth of lace, smallwares, &c.; which raises the total value to £48,208,444.

*France.*—The first import of C. into France took place in 1668—viz., 450,000 lbs. *viâ* Marseille from the Levant. In 1750, the receipts reached 6,978,588 lbs.; but during the wars of the Revolution and the first Empire, little progress was made. In 1815, the import was 36,200,000 lbs.; in 1825, it rose to 55,150,000 lbs.; in 1836, to 118,000,000 lbs.; in 1846, to 159,000,000 lbs.; in 1856, to 211,000,000 lbs.; and in 1859, to 223,000,000 lbs. In 1850, there were in France 694 mills, 115,157 mules, 3,442,550 spindles, and 15,362 machines of other kinds, giving employment to 242,428 hands.

*Switzerland.*—Three-fifths of the C. consumed by this republic are received through France, and the remainder by way of Germany, north and south. The trade of the confederation has flourished considerably. In 1833, its consumption was about 6,000,000 lbs.; in 1843, about 22,000,000 lbs.; in 1859, about 28,000,000 lbs. The first spinning-machine was set up at Zurich in 1807. In 1826, the number of spindles was 300,000; in 1830, 400,000; in 1835, 650,000; in 1840, 750,000; in 1845, 850,000; in 1850, 950,000; and at the present time, about 1,350,000. The number of mills in 1858 was 270, and the number of weaving establishments, 50. The manufactured products of Switzerland are well liked, and compete successfully with those of England in the various continental markets.

*Holland and Belgium.*—Until within the last five years, these two countries consumed about an equal quantity of raw C.; but in 1855 the former country took the lead, and has since far outstripped its neighbour. The consumption of the two nations since 1836 has been as follows:

| Average Periods of Five Years. | Holland. Bales. | Belgium. Bales. |
|---|---|---|
| 1836—40 | 44,937 | 39,500 |
| 1841—45 | 50,420 | 43,560 |
| 1846—50 | 53,000 | 56,600 |
| 1851—55 | 72,000 | 71,000 |
| 1856—59 } 4 yrs. only } | 106,000 | 63,000 |

In 1859, Holland used 125,000 bales, weighing about 53,290,000 lbs.; and Belgium, 64,000 bales, weighing 27,290,000 lbs. There were about 420,000 spindles at work in the latter country in 1845; at the present time, the number is about 650,000. At a corresponding ratio of consumption per spindle, Holland possesses about 1,270,000 spindles.

*The Zollverein.*—Under this head are included the various political divisions of Germany. The several states of the union have made considerable progress in the production of C. fabrics. The consumption of all the states during the five years ending 1840 averaged 61,889 bales; in the next five years, the figures were 79,540 bales per annum. From 1846 to 1850 the onward march was somewhat retarded by the unfavourable monetary and political influences of 1847 and 1848, the consumption of the period named being only 81,400; but from 1850 to 1855 there was an increase of 100 per cent. over the previous five years. For the four years ending 1859, the increase was about 85 per cent., being 226,000 bales per annum. The number of spindles in Germany in 1846 was about 815,000; in 1858, there were 2,027,746, distributed as follows:

| States. | Number of Factories. | Number of Spindles. | Bales of Cotton Consumed. |
|---|---|---|---|
| Saxony, . . . | 134 | 604,646 | 72,700 |
| Bavaria, . . | 18 | 558,700 | 60,250 |
| Prussia, . . . | 26 | 424,000 | 46,000 |
| Baden, . . | 11 | 210,600 | 26,300 |
| Würtemberg, . | 12 | 134,000 | 17,300 |
| Hanover, . . | 2 | 55,800 | 7,000 |
| Oldenburg, . . | 5 | 40,000 | 6,400 |
| Total, | 208 | 2,027,746 | 235,950 |

The C. is received through the ports of Hamburg and Bremen. The import in 1858 was 253,000 bales: about 17,000 bales were purchased by the spinners of Switzerland and Austria. The Germans consume nearly the whole of their own produce, and are large buyers of English yarns and goods besides.

*Austria.*—The manufacturers of Austria receive nearly the whole of their raw material *viâ* Trieste, a small portion is received from the Hanse Towns, but about an equal quantity is taken by the Swiss from Trieste, so that the imports into the latter port may be taken as a fair index of the trade of the Austrian empire (inclusive of Lombardy and Venice). The following table exhibits the number of bales taken for consumption from the port of Trieste during the 24 years ending 1859:

| Average Periods of Five Years. | Bales. | Proportion of the Total Consumption of Europe and United States. |
|---|---|---|
| 1836—40 | 82,377 | 4·02 |
| 1841—45 | 94,480 | 3·88 |
| 1846—50 | 99,400 | 3·65 |
| 1851—55 | 107,000 | 2·96 |
| 1856—59 } 4 yrs. only } | 80,000 | 1·88 |

Here it will be perceived that the figures shew only a small increase down to 1855, whilst they exhibit a positive decrease of 27,000 per annum from that year to 1859. It will also be observed that the total consumption has lagged much behind that of the remaining countries of Europe. The proportional takings of the spinners of Germany in 1836—1840 was 3·04 per cent., or 0·98 per cent. less than Austria; but for the four years 1856—1859, the proportion of the former was 5·31, whilst that of the latter was only 1·88, or 3·43 per cent. less. In 1854 there were in all Austria 1,533,243 spindles at work, giving employment to about 30,000 persons.

*Italy.*—The statistical materials relating to the C. trade of this part of the continent are very scanty; we have them pretty complete, however, from the year 1851. In that year there were taken for consumption from the ports of Genoa and Naples 31,000 bales of C.; in 1853, 51,000 bales; in 1855, 57,000 bales; in 1857, 90,000 bales; in 1859, 101,000 bales. In 1859, the consumption of C. in Italy was considerably in excess of both Austria and Belgium; whilst, four years previously, it was a long way behind both those countries. There is every appearance of the C. manufacture of Italy becoming very extensive, so soon as present political complications are adjusted.

*Spain.*—The C. trade of this kingdom is the oldest in Europe, but has made the slowest progress of any; during the last year or two, however, things have greatly improved. Ten years ago, the consumption was only about 80,000 bales, but, in 1859, it had risen to 118,000 bales, or about 50,310,000 lbs.

*Russia, &c.*—The C. manufacture of this empire is of comparatively recent origin. The imports of raw C. in 1838 were about 28,000 bales; in 1848, about 110,000 bales; and in 1859, 334,000 bales (the latter, however, includes some 45,000 bales imported into Sweden, Denmark, &c.). This immense increase in the consumption of the raw material has considerably curtailed the demand for English yarns. In 1833 we exported 19,311,877 lbs. of yarn to Russia, but in 1859, only 3,413,650 lbs.!

*United States.*—The first cotton-mill built in the United States was in 1791; the second, in 1795; the third, in 1803; the fourth, in 1804; followed by eleven more during the next three years. In 1810, there were 102 mills, containing 31,000 spindles; in 1831, 795 mills, 1,246,503 spindles, and 33,506 looms; in 1850, 1094 mills, with about 4,375,000 spindles, giving employment to 33,150 males, at an average wage of 69*s.* 9*d.* per month, and 59,130 females, at an average wage of 38*s.* 4*d.* per month. In the same year, the capital invested amounted to £15,521,048; 641,240 bales cotton, and 121,099 tons of coal were consumed, and £12,889,413 worth of fabrics produced. The free-trade measures of 1846 and subsequent years rather retarded the progress of this branch of American trade, but latterly the manufacture has shewn considerable vigour, and the spinners of New England, during the year ending 31st August 1860, consumed 927,651 bales out of the southern crop of 4,635,000 bales; being a little under one-fifth. It is likely, therefore, that, in a few years, the competition of the United States will be materially felt by the spinners of Lancashire. The New York Chamber of Commerce, in its last annual report, remarked that England no longer monopolises the office of supplying the world with cotton fabrics, and that the physical and mechanical capabilities of the United States, and other countries, are quite equal to those of Great Britain; whilst the Americans have the advantage of a plentiful supply of C. grown upon their own soil—at their very door.

The following table furnishes particulars of the supply and consumption of C. in Europe and the United States during the past twenty-four years:

STATEMENT OF THE SUPPLY AND CONSUMPTION OF COTTON IN EUROPE AND THE UNITED STATES FROM 1836 TO 1859.
(IN THOUSANDS OF BALES).

| Average Periods of Five Years. | Average American Crop. | Average American Consumption. | Import into Europe. | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total Average of each Description. | | | | | | Proportion of each Description. | | | | | Distribution of the Total Imports. | | | | | | | | | |
| | | | United States. | Brazil. | West Indies, &c. | East Indies. | Egypt. | Total. | United States. | Brazil. | West Indies, &c. | East Indies. | Egypt. | Great Britain. | France. | Belgium. | Holland. | Germany. | Trieste. | Genoa, Naples, &c. | Spain. | Russia and the North. | Total. |
| 1836—40 | 1625 | 255 | 1333 | 139 | 77 | 167 | 143 | 1859 | 71·71 | 7·48 | 4·14 | 8·98 | 7·69 | 1203 | 385 | 44 | 47 | 62 | 91 | | 28 | | 1860 |
| 1841—45 | 2024 | 325 | 1685 | 111 | 55 | 226 | 127 | 2204 | 76·45 | 5·04 | 2·50 | 10·25 | 5·76 | 1484 | 409 | 45 | 49 | 81 | 91 | | 46 | | 2205 |
| 1846—50 | 2210 | 477 | 1618 | 136 | 27 | 213 | 121 | 2115 | 76·50 | 6·43 | 1·28 | 10·07 | 5·72 | 1351 | 352 | 53 | 50 | 79 | 96 | | 134 | | 2115 |
| 1851—55 | 2882 | 576 | 2285 | 147 | 32 | 350 | 214 | 3028 | 75·47 | 4·86 | 1·06 | 11·56 | 7·05 | 1888 | 445 | 72 | 73 | 160 | 103 | 46 | 95 | 146 | 3028 |
| 1856—59 4 years | 3358 | 642 | 2726 | 151 | 33 | 546 | 155 | 3611 | 75·49 | 4·18 | 0·92 | 15·12 | 4·29 | 2169 | 498 | 63 | 105 | 231 | 79 | 97 | 114 | 253 | 3611 |

AMOUNTS TAKEN FOR CONSUMPTION.

| | Total. | | | | | | | | | | | Proportional. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Years. | Great Britain. | France. | Belgium. | Holland. | Germany. | Trieste. | Genoa, Naples, &c. | Spain. | Russia and the North. | Total. | Total including Consumption of United States. | Great Britain. | France. | Belgium. | Holland. | Germany. | Trieste. | Genoa, Naples, &c. | Spain. | Russia and the North. | United States. |
| 1836—40 | 1157 | 373 | 39 | 45 | 62 | 82 | | 28 | | 1786 | 2041 | 56·70 | 18·28 | 1·92 | 2·21 | 3·04 | 4·02 | | 1·33 | | 12·50 |
| 1841—45 | 1366 | 416 | 44 | 50 | 80 | 94 | | 45 | | 2095 | 2420 | 56·45 | 17·19 | 1·82 | 2·07 | 3·31 | 3·88 | | 1·86 | | 13·43 |
| 1846—50 | 1458 | 355 | 57 | 53 | 81 | 99 | | 131 | | 2234 | 2711 | 53·76 | 13·09 | 2·10 | 1·96 | 2·99 | 3·65 | | 4·83 | | 17·62 |
| 1851—55 | 1895 | 442 | 71 | 72 | 100 | 107 | 46 | 96 | 146 | 3035 | 3611 | 52·48 | 12·24 | 1·97 | 2·00 | 4·43 | 2·96 | 1·27 | 2·66 | 4·04 | 15·95 |
| 1856—59 4 years | 2173 | 504 | 63 | 106 | 226 | 80 | 98 | 110 | 255 | 3615 | 4257 | 51·04 | 11·84 | 1·48 | 2·50 | 5·31 | 1·88 | 2·30 | 2·59 | 6·00 | 15·06 |

On glancing at the columns which give the total *supply* and *consumption*, it will be perceived that, down to 1845, the amount of the former considerably exceeded that of the latter: the grand total of the receipts for the ten years ending 1845 being 20,320,830 bales, whilst the deliveries were only 19,405,870 bales, leaving a surplus of 914,960 bales! It was at the close of this period (1845) that the price of C. touched the lowest point which it has ever seen. American planters complained of the unremunerative character of the trade, and the shippers at Bombay found it more profitable to turn their attention to other products; hence supply during the five years ending 1850 fell off very rapidly, the total imports of the period being only 10,578,000 bales against a consumption of 11,173,000 bales, or a deficiency of 595,000 bales, of which 335,000 were American; and notwithstanding the great increase which has taken place, during the last few years, in the amounts of the American crop, and in the supply from other sources, consumption is still ahead, for in the nine years ending 1859 the total stocks had lost a further quantity of 86,000 bales. It will be observed that this scantiness in supply has been owing almost entirely to a decline in the proportional receipts from the United States, traceable to the double influence of slower production, in consequence of lower prices, and the increasing requirements of American manufacturers already noticed. During the five years ending 1850, though the total consumption of Europe advanced at the rate of 6·63 per cent. per annum, the American supply to Europe shewed a decrease of 4 per cent., notwithstanding an increase of 7 per cent. in the crops raised; the consumption of the United States, however, exhibited an increase of 47 per cent.! So that, whilst the import into Europe had fallen off 335,200 bales in the five years, the takings of American spinners had increased by 762,130 bales! Since 1852, the supply of American C. to Europe has about equalled the demand, owing to a falling off in American consumption, the average being much reduced by the effects of the panic of 1857 and other causes: the total deliveries being only 595,562 bales in 1857—1858, against 819,936, or 26½ per cent. of the crop, in 1856—1857; but renewed activity has now taken place, and last year (1859—1860) the home-trade of the United States took 927,651 bales. For the eight years ending 1857—1858, the crops averaged about 3,000,000 bales; but during the two subsequent seasons there has been an extraordinary increase in the American yield; the total in 1858—1859 being 3,851,481 bales, and in 1859—1860, 4,675,770 bales! But notwithstanding this immense increase, the average of the two years being 42 per cent. over that of the previous eight years, the whole or nearly the whole of the extra supply has been bought up by consumers at a price only 4 per cent. below the average of the last five years, viz., 10·75 cents per lb. against 11·21 cents per lb. for 1856—1860, and 9·64 cents per lb. for 1851—1855! It was facts such as these which originated the Cotton Supply Association, whose object it is to obtain the development of the soils of the various colonies of Great Britain, the coast of Africa, &c., and so enable the English C.-spinners to be less dependent upon the produce of the United States, the competition for which, as well as the precarious nature of the crop, has rendered the supply to Lancashire, &c., uncertain and high priced.—March 1861.

In the healing art, C., and the cloth and wadding made from it, are used for wrapping up and keeping warm, and of late much more than formerly for binding up burns and wounds. A prejudice formerly prevailed against the use of C., as irritating to wounds; but experience has shewn this opinion to be unfounded, and C. is now used in many hospitals quite as freely as linen.

*Cotton Manufacture.*—It has already been remarked, that the modern system of cotton manufacture dates no further back than about 1760. Prior to the mechanical inventions of Hargreaves, Arkwright, Crompton, and Cartwright, the arts of spinning and weaving were entirely domestic, and the instruments of manipulation much the same as those which had been in use in the East for centuries before. By means of the ancient distaff and spindle, or the more recent spinning-wheel, only *one* thread at a time was produced, and the process, as may be imagined, was tedious, and not very remunerative; besides which, only a very inferior yarn was the result; for whilst a tolerable thread could be spun from flax, the produce of cotton was soft, weak, and uneven, and in weaving was used for *weft* (or *transverse* yarn) only, with linen, woollen, or worsted for the *warp* (or *longitudinal* yarn). Altogether, in the middle of the 18th c., the machinery for spinning was much more imperfect than that for weaving, and the weavers of the time were often at a stand for want of yarn to go on with.

This state of things had long occupied the attention of the thinking portion of the spinners, but without any practical result until the invention of the 'jenny,' by Hargreaves, about 1767. By this machine, eight threads at a time could be spun against the one of the spinning-wheel. Hargreaves was much abused by the populace of his native town and neighbourhood, who feared that the invention would deprive them of all employment; the machine was destroyed, and the inventor compelled to leave his birthplace. Genius, however, ultimately triumphed, and the 'spinning jenny' was patented at Nottingham in 1770. The year previously, Arkwright had patented his 'water-frame,' or 'throstle,' for spinning by rollers, by means of which a stronger and much firmer yarn was produced. It was about this period that fabrics composed entirely of cotton were woven for the first time, the 'jenny' supplying the *weft*, and the 'throstle' the *warp*. A few years later, Mr Crompton brought out a new piece of mechanism, which he styled the 'mule jenny,' from its combining the principles of both Hargreaves' and Arkwright's patents; but it had an advantage over both, insomuch as it produced a much finer yarn than either. The 'mule' came into full play in or about 1780, which is the period assigned for the birth of the *muslin* trade. There was now no longer a scarcity of yarn; the fear was that there would be too much, for it was clear that the hand-loom weavers of the time could not keep up with the improved spinning machinery. But the invention of the 'power-loom,' by Dr Cartwright, in 1785, set aside all doubts in this respect: the question now was, whether a sufficient quantity of raw cotton could be obtained in order to keep pace with the requirements of the rising manufacture. West India cotton, which in 1784 averaged 1*s.* 6*d.* per lb., rose to 2*s.* in 1788; 2*s.* 1*d.* in 1792; and 2*s.* 8*d.* in 1798. Great exertions were made to obtain increased supplies from India; but the invention of the saw-gin in America brought the required succour from an unexpected quarter. It was only by means of this machine that the production of the short-stapled cotton of the United States could be made at all remunerative. The export of hand-cleaned cotton in 1791 was only 189,316 lbs., and in 1792 only 138,328 lbs.; but the year after the appearance of the gin—viz., 1794—the exports rose to 1,601,700 lbs.; in 1795, to 6,276,300 lbs.; and in 1800 to 17,789,803 lbs.

But to return. The first 'mule-jenny' contained about *thirty* spindles, which, instead of being stationary, as in the 'jenny' and 'throstle,' were placed on a carriage, which was moved outwards, in order, whilst twisting, to increase the fineness of the thread, and inwards again to wind the yarn on the spindles. This required the constant attendance of a spinner to wheel the carriage backwards and forwards; but subsequent improvements have gone so far as to produce what is called the self-acting mule, two or three of which only require the assistance of one person, generally a boy or girl, whose place it is to piece any of the threads which may break during spinning. Mules of this construction are made with as many as 1000 or 2000 spindles, sometimes more; and with the self-actor, as now improved, a single thread has been produced measuring upwards of *one thousand miles in length*, and yet weighing but *one pound!*

A word or two on the processes preliminary to spinning. The raw material is received from the various producing countries, packed either in bags or square bales. The average weight per bale of the imports of 1859 was as follows: United States, 448 lbs.; Brazils, 181 lbs.; Egyptian, 369 lbs.; East Indies, 385 lbs.; West Indies, &c., 180 lbs.; all kinds, 428 lbs. On arrival at the mill, the cotton first enters the *mixing-room*, where it is *sorted*, and the various qualities, which are often contained in a single purchase, laid out in layers of equal extent, one over the other, and trodden close together. In this manner, two descriptions of wool are sometimes placed in one mixing. When Surat, for instance, is scarce and dear, and short-stapled low American plentiful and cheap, spinners of what are called coarse numbers invariably use a mixture of both growths; the same of other kinds, provided there is an approach to equality in length of fibre. C. of different shades of colour are also sometimes spun together, in order to produce a particular yarn. A quantity of this *bing*, as it is called, is then raked down from the top to the bottom of the side, a portion of each layer being thus secured. This is carried to the *scutching* or *willowing machine*—a piece of mechanism composed of a feeding apron, and two sets of rollers and beaters. The first set of rollers, turning in opposite directions, drag the C. through, and transfer it to the first pair of beaters, which, revolving with immense rapidity, thrash out nearly all the sand, seeds, and other impurities which are contained in the wool; the second pair of rollers and beaters repeating and completing the process. The cleaned cotton is then taken to the *spreading-machine*, through which it passes, and is then wound, in a fleecy state, upon a large wooden roller, to be transferred to the *carding-machine*. The latter machine is brought into requisition for the purpose of drawing out the fibres of the C. into parallel layers, so as to facilitate the twisting of them together. Originally, this process was performed by hand. The first improvement was made by Lewis Paul in 1748, and the next by Hargreaves in 1760. Arkwright and subsequent spinners have perfected the machine. The C. was formerly cleaned by hand; Sea Island C. is so to this day. The *sliver* is next passed through the *drawing-frame*, which removes all inequalities, and reduces the bands to one uniform thickness. Here also several of the slivers are joined together (called *doubling*), so as to form one continuous cord, which is still further lengthened and increased in fineness by the *roving-machine*, whence it passes on to bobbins ready for *spinning*. Under the heads SPINNING and WEAVING, it is intended to give a full description of the various processes above briefly glanced at. Other branches of the subject will be found treated of under CALICO-PRINTING; CALENDERING; DYEING, &c.

The finer kinds of yarn are spun from Sea Island and long-stapled Egyptian, and from them are fabricated our muslins, laces, &c. From Brazil and the better classes of short-stapled American, come our cambrics, calicoes, shirtings, sheetings, &c.; and from the inferior qualities of American and Surat are spun the coarse yarns required for fustians and other heavy fabrics. Yorkshire broadcloths are sometimes half cotton. From warps of C., and wefts of wool or worsted, are formed varieties of Orleans cloths, Coburgs, mousselines de laine, damasks, &c. There are also fabrics composed of silk and C., linen and C., alpaca and C., &c.

Of the total amount of yarn produced, about one-fourth is exported in its raw state. The following figures will give the reader an idea of the progress of our export trade in C. yarns and goods:

| | YARN. | | | MANUFACTURED GOODS EXPORTED. | | | |
|---|---|---|---|---|---|---|---|
| | Total Spun. | Total Exported. | | Entered by the Yard. | | At Value only. | Total Value of Yarn and Goods. |
| | lbs. | lbs. | £ | Yards. | £ | £ | £ |
| 1816, . . | 78,987,200 | 15,740,675 | 2,628,448 | 189,263,731 | 12,309,079 | 746,643 | 15,684,170 |
| 1830, | 222,840,000 | 63,678,116 | 4,133,741 | 441,578,498 | 14,119,770 | 1,175,153 | 19,428,664 |
| 1845, . . | 494,766,000 | 135,766,487 | 6,963,235 | 1,091,686,069 | 18,029,818 | 1,126,288 | 26,119,341 |
| 1859, . | 871,021,000 | 192,341,516 | 9,465,704 | 2,563,445,393 | 37,040,127 | 1,702,613 | 48,208,444 |

Forty years ago, the continent of Europe was the principal consumer of English yarns, but now the East Indians and Chinese are our largest buyers. In 1818, 14,743,675 lbs. of twist were exported, of which 14,727,882 lbs. went to Europe, and only 1861 lbs. to India and China. In 1843, 149,206,448 lbs. were exported; 128,664,218 lbs. to Europe; 899,746 lbs. to America and Africa; and 12,642,484 lbs. to India and China. In 1859, of the 192,341,516 lbs. shipped, 44,006,352 lbs. were to India alone.

In 1820, Germany was the best customer for both our plain and printed cottons. The next largest consumer for *plain* cottons was Italy; then followed the Brazils, United States, Russia, Portugal, East Indies, Holland and Belgium, West Indies, &c.; and for *printed* cottons—British West Indies, United States, Italy, Holland and Belgium, Portugal, East Indies, Brazil, &c. The Netherlands were the principal buyers of our laces and small-wares; then Germany, British West Indies, Central America, Brazils, United States, East Indies, Portugal, Russia, Italy, &c. At the present time, the East Indies take nearly one-third of our exported manufactured goods. For *plain calicoes*, our next best customer is China; then United States, Turkey, Brazils, Egypt, Portugal, Germany, &c.; for *printed* or *dyed calicoes*, the United States are the largest purchasers; then follow Turkey, Brazils, East Indies, Germany, Chili, Java, British North America, Central America, West Indies, &c. The United States take nearly one-fourth of our *plain cambrics and muslins;* then come the East Indies, Brazils, Australia, Turkey, British West Indies, &c. Of *printed* and *dyed cambrics and muslins*, the Brazils take the largest share, then Cuba, East Indies, United States, Australia, &c. The Italians are the largest purchasers of our fustians and velvets; next, United States, British colonies, Austria, &c. Germany takes one-fourth of our *laces and nets;* then come the United States, Holland, Belgium, East Indies, &c. More than one-half of the C. stockings exported go to the transatlantic republic; the British possessions in various parts of the world come next in order. The same is pretty nearly the case with our small-wares, &c. Of C. for sewing, the United States take one-third; then follow Germany, Italy, South, Central, and North America.

With the great improvements which have taken place in the mechanics of the trade, and the reduced price of the raw material, a gradual but large decline has taken place in the cost and price of the fabrics produced. The price of 1 lb. of yarn, containing 100 hanks, in 1786, was 38*s.*; in 1807, 6*s.* 9*d.*; in 1829, 3*s.* 2*d.*; at the present time, 2*s.* 6*d.*! The *cost* of weaving during the last sixty years has been reduced upwards of 60 per cent. A species of calico, selling at 6*s.* per yard towards the close of the last century, can be purchased in our day at less than as many pence! The average price per yard of *goods* exported in 1815 was 1*s.* 5¼*d.*; in 1825, 10⅛*d.*; in 1835, 6½*d.*; in 1845, $3\frac{15}{16}$*d.*; and in 1859, $3\frac{7}{16}$*d.* The average price per lb. of *yarn* exported in 1815 was 3*s.* 7⅜*d.*; in 1825, 1*s.* 11½*d.*; in 1835, 1*s.* 4⅜*d.*; in 1845, 1*s.* 0¼*d.*; and in 1859, 11¾*d.* The most profitable years for spinners are said to be 1845, 1848, and the past two years (1859—1860). The earnings of the work-people are higher at the present time than they have ever been before. The following table, from a paper by David Chadwick, Esq., of Salford, supplies some interesting particulars on this subject:

AVERAGE WEEKLY WAGES.

| | 1839. | 1849. | | 1859. | |
|---|---|---|---|---|---|
| | Week of 69 Hours. | Weeks of 60 Hours. | | | |
| | s. | s. | d. | s. | d. |
| Steam-engine tenters, . . | 24 | 28 | 0 | 30 | 0 |
| Warehousemen, . | 18 | 20 | 0 | 22 | 0 |
| *Carding Department—* | | | | | |
| Scutchers (women and girls), | 7 | 7 | 6 | 8 | 0 |
| Strippers (young men), . | 11 | 12 | 0 | 14 | 0 |
| Overlookers, . . . . | 25 | 28 | 0 | 28 | 0 |
| *Spinning on Self-acting Mules—* | | | | | |
| Minders, . . . . . | 16 | 18 | 0 | 20 | 0 |
| Piecers (women and young men), . . . | 8 | 9 | 0 | 10 | 0 |
| Overlookers, . | 20 | 22 | 0 | 26 | 0 |
| *Throstle Spinning—* | | | | | |
| Spinners (girls 14 to 18 years), | 4 | 4 | 6 | 5 | 0 |
| 〃 (women), . . | 7 | 7 | 6 | 9 | 0 |
| Overlookers, . . . | 18 | 20 | 0 | 24 | 0 |
| *Ruling—* | | | | | |
| Throstle reelers (women), . | 9 | 9 | 6 | 9 | 6 |
| Warpers, . . . . . | 22 | 22 | 0 | 23 | 0 |
| Sizers, . . . . . . | 23 | 23 | 0 | 25 | 0 |
| *Doubling—* | | | | | |
| Doublers (women), . | 7 | 7 | 6 | 9 | 0 |
| Overlookers, . . | 24 | 25 | 0 | 28 | 0 |

Other branches shew the same ratio of advance.

The following table exhibits the extent of the manufacture at the close of 1859:

| | |
|---|---|
| Estimated weight of *cotton* consumed, . | lbs. 977,989,000 |
| 〃 value of same, at $6\frac{1}{4}d.$ per lb., | £25,468,464 |
| 〃 weight of *yarn* produced, . | lbs. 871,021,000 |
| Declared weight of yarn exported, . | lbs. 192,341,516 |
| 〃 value of yarn exported ($11\frac{3}{4}d.$ per lb.), . . . . . . . | £9,465,704 |
| Number of yards of goods exported, . | yards. 2,563,445,393 |
| Declared value of same ($3\frac{7}{16}d.$ per yard), | £37,040,127 |
| 〃 〃 other cotton goods exported, . . . . . . . . | £1,702,613 |
| Total declared value of all cotton manufactures exported, . . . . | £48,208,444 |
| Total declared value of all British exports, | £130,440,427 |
| Proportion of *cotton* exports to *entire* exports per cent., . . . . | 37 per cent. |
| Estimated number of persons employed, | 415,000 |
| 〃 average rate of wages per week, | 10*s.* 6*d.* |
| 〃 total amount of wages paid in twelve months, . . . | £11,412,000 |

ESTIMATED FIXED CAPITAL.

| | | |
|---|---|---|
| Cost of 30,750,000 spindles, at 24*s.* to 25*s.* per spindle, inclusive of buildings, &c. | £36,000,000 | |
| Cost of 525,000 power-looms, at £24 each, . . . | 12,600,000 | £48,600,000 |

ESTIMATED FLOATING CAPITAL.

| | | |
|---|---|---|
| Employed in carrying on the routine of business, . | £15,000,000 | |
| Cash at bankers, . . . . | 10,000,000 | |
| | | £25,000,000 |

**COTTON**, GUN. See GUN COTTON.

**COTTON**, SIR ROBERT BRUCE, a distinguished English antiquary, founder of the Cottonian Library, now in the British Museum, was born at Denton, Huntingdonshire, 22d January 1570. He was educated at Cambridge, and soon after taking his degree of B.A. in his 16th year, he commenced those archæological pursuits which have made his name famous, and proved of such immense value to British historians. The dissolution of the monasteries about half a century before, dispersed many valuable collections of manuscripts into private hands, and C. hunted up and purchased these wherever practicable. On account of his eminent abilities and great knowledge, he was frequently consulted by ministers of state on difficult constitutional points and international questions. In 1600, at the request of Queen Elizabeth, who desired to have the views of the Society of Antiquaries on the matter, he wrote *A Brief Abstract of the Question of Precedency between England and Spain.* King James, by whom he was made a knight, employed him to vindicate the conduct of his mother, Mary Queen of Scots, and also to examine whether the Roman Catholics, on account of whom some alarm was then felt in the nation, should be imprisoned or put to death. C. took the most humane view of the matter. His intimacy with the Earl of Somerset led him to be suspected of complicity in the death of Sir Thomas Overbury, and in consequence he was imprisoned for about five months. In 1629, a tract entitled *A Project how a Prince may make himself an Absolute Tyrant,* was obtained from his library, the tendency of which was considered dangerous to the liberty of the state. His library was accordingly declared unfit for public inspection, and he himself was denied all use of it. His heart being bound up in his library, he pined and died in less than two years after, on 6th May 1631.

The COTTONIAN LIBRARY, which now forms so important a part of the British Museum, was, after the death of Sir Robert C.'s son and grandson, who augmented it considerably, invested in trustees for the use of the public. In 1730, the library was removed to Ashburnham House, Westminster, where the royal collection was; and in the following year a fire occurred in the house, in which about 114 out of the 958 MS. volumes of which the library consisted were reported as 'lost, burned, or entirely spoiled; and 98 damaged so as to be defective.' Fortunately, however, under the care and intelligence of skilful keepers, a great number of these injured volumes have been restored, so that the library now consists of nearly 900 volumes, of which, says Mr Edwards in his *Memoirs of Libraries,* 'nearly 200 are state papers of the highest value. They include a vast series relating to the diplomatic intercourse between England and almost every state of Europe, extending from the reign of Edward III. to that of James I.; and of these documents, no small proportion consists of the original letters of sovereigns and of statesmen. Even those papers which are not original have a high degree of authority, as being, for the most part, coeval transcripts.' The Cottonian Library was transferred to the British Museum (q. v.) in 1757. In addition to the MSS., the Cottonian collection consists of many valuable coins and antiquities.

**COTTON GRASS** (*Eriophorum*), a genus of plants of the natural order *Cyperaceæ*, having the fruit accompanied with long silky hairs which spring from the base of the ovary. The species are not very numerous; they are natives of the colder regions of the northern hemisphere. Several are found in Britain, and their white cottony fruit-bearing spikes are well known in our moors and bogs. The cottony substance has been used for stuffing pillows, making candle-wicks, &c. Mr Helliwell recently shewed that a firm and beautiful cloth can be made of it; and, according to him, it might be gathered in some places, without cultivation, at a cost of

Cotton Grass (*Eriophorum*).

twopence or threepence per pound. The stems of a Himalayan species, *E. cannabinum*, called *Bhabhur*, yield a very strong fibre, and are much employed for making cordage, being simply twisted into cables, of which rope-bridges are usually made; but they are not durable, and require much repairing every year.—C. G. is said to be valuable for sheep-pasture. Its leaves were formerly employed as a remedy for diarrhœa, and the spongy pith of the stem to expel tape-worms.

**CO'TTONWOOD.** See Poplar.

**CO'TTUS**, a genus of acanthopterygious fishes, of the *Mailed Cheek* family or *Sclerogenidæ*, having a large depressed head, more or less armed with spines or tubercles, a tapering body destitute of scales, and two dorsal fins. Some of the species are marine, others inhabit fresh water. Of the latter, the Bull-head (q. v.) is an example. The marine species are mostly found in northern seas. A few occur on the shores of Britain, of which the most common are the Sea Scorpion (*C. scorpius*) and the Father Lasher (*C. bubalis*); both of which are very often left by the receding tide in rock-pools, and amongst sea-weeds. The greatest size to which they attain on the British coasts is only about 10 inches, but in more northerly seas, they become much larger. They form a principal part of the food of the Greenlanders. Notwithstanding their large gill-openings, they live long out of water.

**COTU'RNIX.** See Quail.

**COTYLE'DON** (Gr. the name of a plant) or **SEED-LOBE**, in Botany, a principal part of the embryo in phanerogamous or flowering-plants. Cryptogamous plants are *Acotyledonous* (q. v.); their seeds or *spores* have no cotyledons. Phanerogamous plants are divided according to their seeds into *Monocotyledonous* (q. v.), having only one C., and *Dicotyledonous* (q. v.), having two cotyledons. With the latter are ranked some *Coniferæ* remarkable for having more than two cotyledons, which form a sort of whorl. The cotyledons enclose the *plumule* or *gemmule;* and in germination they usually come above ground as the first leaves (seed-leaves) of the young plant—the plumule in dicotyledonous plants, appearing between them—and they become at the same time more leaf-like; but in some plants, which have thick fleshy cotyledons, they remain underground. In either case, they contain a store of nourishment, by which the young plant is sustained on its first germination. Instances of cotyledons remaining under ground, may be seen in the common pea and bean; and instances of cotyledons coming above ground, in the kidney-bean and scarlet-runner, plants of the same natural order. Cotyledons are sometimes very thick, sometimes very thin and delicate; those of the same seed are generally equal, but not always so; they are frequently undivided, but sometimes cut and -lobed. The cotyledons of dicotyledonous plants are often simply applied face to face; when if the radicle is folded along their edges, they are said to be *accumbent;* if it is folded on their back, they are *incumbent.* Sometimes the two cotyledons of a seed are *conduplicate*, or laterally folded; sometimes they are *reclinate*, or folded from apex to base; sometimes *convolute*, or laterally rolled up; sometimes *circinate*, or spirally rolled up with the apex innermost. These terms are of importance in descriptive botany, as characters of high value are often furnished by the seed.

Couchant.

**COU'CHANT.** In Heraldry, a beast lying down, with his head up, is couchant. If the head is down, he is Dormant.

**COUCH GRASS** (*Triticum repens*), also called *Wheat Grass, Dog Grass, Quickens,* and *Squitch* or *Quitch*, a grass which, although of the same genus with wheat, is chiefly known to British farmers as a troublesome weed. It is common in most parts of Europe and North America. It grows to a height of 1½—3 feet, and has two-rowed spikes and flat spikelets, the side of which is applied to the rachis. It is perennial, and its creeping roots render it extremely difficult of extirpation; they are carefully gathered out of land under cultivation, but they make the plant very useful in fixing loose sandy soils, so as to form pasture. It is not, however, esteemed a very nutritious grass. The roots are sweet and mucilaginous, and are collected at Naples for feeding horses; they have also been dried and ground into meal, to make bread in times of scarcity. A kind of beer is made from them, and in some countries they are much used in domestic medicine. They are diaphoretic and aperient.—The popular name *Squitch*, or *Quitch*, is also given to some other perennial grasses.

Couch Grass.

**COUCHING.** See Cataract.

**COUCY, Renaud, Castellan of**, a court-poet belonging to the north of France, who flourished probably in the latter part of the 12th century. The love-songs ascribed to him are distinguished above all similar productions of the same epoch by the great warmth of passion displayed. They are addressed, of course, to a mistress, whose name, in accordance with the fashion of the time, is not mentioned. From their contents, we can gather little or nothing of the circumstances of C.'s life, except that he had become a crusader, and had separated himself very reluctantly from the object of his adoration. It is supposed that he accompanied Philippe Auguste and Richard Cœur de Lion to the Holy Land, probably in the service of Raoul Sieur de Coucy, with whom, indeed, he is often confounded. Like Tristan and Isolde, C. and his mistress soon became patterns of true but unfortunate lovers. As early as the first half of the 13th c., the *Roman d'Aventure* gives a very prolix and incredible account of both. The best edition of the *Chansons du Châtelain de C.* was edited by Franç. Michel (Paris, 1830).

**COU'GAR.** See Puma.

**COUGHING**, considered physiologically, consists, 1st, in a long inspiration which fills the lungs to a greater extent than usual; 2d, in the closure of the glottis, or narrow opening in the organ of voice (see Larynx), at the commencement of the act of expiration; and, 3d, in the sudden forcing open of the glottis by the violence of the expiratory movement. In this way, a blast of air is driven upwards from the lungs through the mouth, which carries with it any sources of irritation that may have been present in the air-passages. C. may occur from irritation in the back of the throat, in the larynx, trachea, or bronchial tubes, and may be excited by acrid vapours, by irritant gases, or by articles of food or drink—such as even a drop of water or a crumb of bread—making their way into the air-passages instead of into the pharynx, or by excessive or morbid secretion from the walls of the air-tubes, or even by the entrance of cold air, when the lining membrane of the air-passages is abnormally irritable.

It is not very easy to explain to the non-professional reader *how* cough is produced. From the medulla oblongata, or uppermost part of the spinal cord (lying within the cavity of the cranium), there is given off a very important nerve called, from its distribution to the lungs and stomach, the pneumogastric nerve (q. v.), which contains both sensory and motor filaments. The sensory filaments are distributed to the mucous lining of the larynx, trachea, &c. Any of the irritating substances already mentioned may produce an impression upon these sensory filaments which, being conveyed to the medulla oblongata, gives rise, through the motor filaments, to the transmission of motor impulses to the various muscles which are concerned in the act of coughing. Other motor nerves, especially those supplying the intercostal muscles and the diaphragm, co-operate powerfully with the motor filaments of the pneumogastric.

The object of C. in the animal economy is unquestionably to guard against the danger of the entrance of mechanical and chemical irritants into the air-passages; and accordingly the mucous membrane, especially of their upper part, is endowed with a most exquisite sensibility which, when aroused by irritation or by a state of disease, provokes incessant coughing until the irritation be allayed or removed. Cough is an exceedingly common symptom of all diseases of the respiration. See PNEUMONIA, CONSUMPTION, BRONCHITIS, CATARRH, &c.

Cough occurs amongst the lower animals under similar conditions. From continued breathing of a close foul atmosphere, the bronchial mucous membrane becomes unduly irritable, hence the prevalence of chronic cough amongst the cows in our overcrowded town-dairies. Chronic cough also occurs in horses, usually as a sequel to repeated attacks of bronchitis. It constitutes unsoundness, is best treated by repeated doses of belladonna and camphor, but often requires for its entire removal a run at grass.

**COULOMB**, CHARLES AUGUSTIN DE, known by his experiments on friction, and his invention of an instrument—the *Torsion Balance* (q. v.)—to measure the force of magnetic and electrical attraction, was born at Angoulême in 1736, and in early life entered the engineers. In 1777, he gained a prize by an essay on the construction of magnetic needles (*Sur les Aiguilles Aimantées*). In 1779, his *Théorie des Machines simples* gained the prize offered by the Academy; and in 1781, he was a third time successful in an essay on the friction and resistance of cordage, &c., used in machines. In the same year he was elected as member of the Academy, and his services were employed on all the most difficult problems in mechanics. Having offended certain influential persons by reporting unfavourably on their project of a navigable canal in Bretagne, C. was for some time imprisoned, but received from the States of Bretagne a present of a seconds' watch, as a reward of his firm opposition to an expensive and unprofitable scheme. C. lived in retirement during the Revolution; became a member of the Institute, 1804; and died August 23, 1806.

**COU'LTER.** See PLOUGH.

**COU'MARIN**, or **TO'NKA STEAROPTEN** (see STEAROPTEN), is a camphor-like substance of a very agreeable smell, which gives their fragrance to the well-known Tonka Bean (q. v.), (*Dipterix odorata*), so much used for flavouring snuff; the Woodruff (*Asperula odorata*); the Melilot (*Melilotus officinalis*); a number of grasses, as the sweet-scented Vernal Grass (*Anthoxanthum odoratum*); and the Faam or Faham leaves (*Angræcum fragrans*), much prized among the Asiatics for their vanilla-like scent; and is probably the cause of similar fragrance in many other plants. C. may be procured from Tonka beans by digestion in ether. It crystallises in small prisms, is colourless, has the smell of the bean, and is scarcely soluble in cold water, but dissolves pretty easily in boiling water. A beverage well known in Germany as *May Drink*, and made of wine and woodruff, derives its flavour from coumarin.

**COU'NCIL**, or **SY'NOD**, is an assembly of ecclesiastical dignitaries held for the purpose of regulating the doctrine or discipline of the church. As early as the 2d c., church councils were convened in which only one or two provinces took part, the bishops and presbyters binding themselves to carry out the decisions arrived at in their own communities. These assemblies were commonly held in the chief town or metropolis of the province, and the bishops of such capitals—who, after the 3d c., bore the title of *metropolitan*—were wont to preside over the meetings, which possessed no other legislative power than flowed from the mutual agreement of the members. Over these provincial councils were established, at a later period, the diocesan synods, exercising authority over several united provinces; and finally, the national councils. After the 4th c., when the Christian religion was established in the Roman empire, we read of *œcumenical*, i. e., universal councils, so called because all the bishops of Christendom were invited or summoned by the emperor. In earlier times, all Christian teachers, presbyters, and others, were invited to take part in the councils, but after the opening of the 4th c., only the bishops were convened. According to the doctrine of the Roman Catholic Church, the pope alone, or, by way of exception, in some cases the college of cardinals had the power of convening œcumenical councils, which were supposed to represent the universal church under the guidance of the Holy Ghost. Questions were determined by the majority of votes, and the pope or his proxy presided and confirmed the resolutions carried in the synod. In matters of faith, councils professed to be guided by the Holy Scriptures and the traditions of the church; while in lighter matters, human reason and expediency were consulted. In the former, œcumenical councils are held to be infallible, and hence it is maintained that all such synods have agreed together; but in other matters of discipline, &c., the latest synod decides questions. The question of the pope's subordination to the decrees of the œcumenical councils was long and warmly debated. Nineteen œcumenical councils are recognised in the Roman Catholic Church—9 eastern and 10 western.

1. The synod of apostles in Jerusalem, wherein the relation of the Christian doctrine to the Mosaic law was determined. (See Acts, c. xv.) 2. The first C. of Nice, held 325 A. D., to assert the Catholic doctrine respecting the Son of God in opposition to the opinions of Arius. 3. The first C. of Constantinople, convoked under the Emperor Theodosius the Great (381 A. D.), to determine the Catholic doctrine regarding the Holy Ghost. 4. The first C. of Ephesus, convened under Theodosius the Younger (431 A. D.), to condemn the Nestorian heresy. 5. The C. of Chalcedon, under the Emperor Marcian (451 A. D.), which asserted the doctrine of the union of the divine with the human nature in Christ, and condemned the heresies of Eutyches and the Monophysites. 6. The second C. of Constantinople, under Justinian (553 A. D.), which condemned the doctrines of Origen, Arius, Macedonius, and others. 7. The third C. of Constantinople, convoked under the Emperor Constantine V., Pogonatus (681 A. D.),

for the condemnation of the Monothelite heresy. 8. The second C. of Nice, held in the reign of the Empress Irene and her son Constantine (787 A. D.), to establish the worship of images. Against this C., Charlemagne convened a counter synod at Frankfort (794 A. D.). 9. The fourth C. of Constantinople, under Basilius and Adrian (869 A. D.), the principal business of which was the deposition of Photius, who had intruded himself into the see of Constantinople, and the restoration of Ignatius, who had been unjustly expelled. 10. The first Lateran C., held in Rome under the Emperor Henry V., and convoked by the pope, Calixtus II. (1123 A. D.), to settle the dispute on investiture (q. v.). 11. The second Lateran C., under the Emperor Conrad III. and Pope Innocent II. (1139 A. D.), condemned the errors of Arnold of Brescia and others. 12. The third Lateran C., convened by Pope Alexander III. (1179 A. D.), in the reign of Frederick I. of Germany, condemned the 'errors and impieties' of the Waldenses and Albigenses. 13. The fourth Lateran C., held under Innocent III. (1215 A. D.), among other matters asserted and confirmed the dogma of transubstantiation and necessity for the reformation of abuses and the extirpation of heresy. 14. The first œcumenical synod of Lyon, held during the pontificate of Innocent IV. (1245 A. D.), had for its object the promotion of the Crusades, the restoration of ecclesiastical discipline, &c. 15. The second œcumenical synod of Lyon, was held during the pontificate of Gregory X. (1274 A. D.). Its principal object was the re-union of the Greek and Latin churches. 16. The Synod of Vienne in Gaul, under Clemens V. (1311 A. D.), was convoked to suppress the Knights Templars, &c. 17. The C. of Constance was convoked at the request of the Emperor Sigismund, 1414 A. D., and sat for 4 years. It asserted the authority of an œcumenical C. over the pope, and condemned the doctrines of John Huss and Jerome of Prague. 18. The C. of Basel was convoked by Pope Martin V., 1430 A. D. It sat for nearly 10 years, and purposed to introduce a reformation in the discipline, and even the constitution of the Roman Catholic Church. All acts passed in this C., after it had been formally dissolved by the pope, are regarded by the Roman Catholic Church as null and void. 19. The celebrated C. of Trent, held 1545—1563 A. D. It was opened by Paul III., and brought to a close under the pontificate of Paul IV. A detailed account of the more important of these œcumenical councils is given under the separate heads, Nice, Basel, Constance, Trent, &c.

Among the provincial or local synods convened after the division of the church into east and west, we may mention that of Clermont (1096 A. D.), when the first crusade was proposed, and that of Pisa (1409 A. D.), when three popes were contending for the see of Rome. Among Protestants no general C. has ever been convened; but several particular synods have decided various questions. Of these synods one of the more remarkable was that of Dort in 1618, when Calvin's creed was asserted against the Arminians.

The decrees of the councils of the Roman Catholic Church were edited by Mansi (31 vols., Florence and Venice, 1759—1798).

**COUNCIL**, Privy. See Privy Council.

**COUNCIL**, Town. See Town Council.

**COUNCIL OF WAR** is a conference of officers, in military or naval warfare, on some matter in which the commander wishes to fortify his judgment by an appeal to that of others. The French make a special provision for a Council of Defence in a garrison. The governor or commandant may summon the heads of departments to meet him in consultation whenever he may think such a step desirable; and the opinions expressed at such meetings are placed upon record. The commandant of a garrison generally solicits the opinion of a C. of W. before surrendering to besiegers. The English military code leaves these matters to the discretion of the commander. In the navy, a C. of W. consists usually of flag-officers only; but officers of lower rank occasionally assist.

**COU'NSEL.** See Advocate and Barrister.

**COUNT** (Fr. *comte;* Lat. *comes*). In classical writers, down to the end of the 4th c., the meanings attached to the word *comes* were comparatively few and simple. At first it signified merely an attendant, and differed from *socius* chiefly in expressing a less intimate and equal relation to the person accompanied. Suetonius uses it for an attendant on a magistrate. A little later, in Horace's time, it was applied to those young men of family whom it had become customary to send out as pupils under the eye of the governor of a province, or the commander of an army. Very soon the fashion of having similar attendants at home was introduced, and Horace speaks of this necessity as one of the miseries of a high position. The emperor, of course, had many *comites* in this sense; and to these, as he gradually became the centre of power, he transferred the various offices of his household, and even of the state. Around his person these comites formed a sort of council of state, very much resembling that instituted by the first Napoleon. The example of the emperors of the west was followed by the emperors of the east, though at Byzantium the title attached less to the office than to the individual. Most of the titles of our own court officials are translations of those belonging to similar officers in the lower empire. The *comes sacrarum largitionum* was the grand almoner; the *comes curiæ*, the grand-master of ceremonies; the *comes vestiarius*, the grand-master of the wardrobe; *comes equorum regiorum*, the grand equerry, &c. The *comes marcarum*, or count of the marches, there can be little doubt, was the original of the *marquis* of later times. In France, the C. of the palace (*comes palatii nostri*) was the highest dignitary in the state after the *maire* of the palace; and in the 11th c. he had already acquired a rank apart from that of the other counts. He presided in the court of the sovereign in his absence, and possessed sovereign jurisdiction. The habit of instituting counts-palatine was adopted by Spain and England. Those counts, again, who, at a later period, as rulers of provinces, assumed something approaching to sovereign power, arrogated to themselves the right of appointing counts-palatine under them—e. g., the Counts of Chartres, of Champagne, of Blois, Toulouse, &c.; and the ancient houses of Chartres and of Blois continued to claim in perpetuity the title of C.-palatine as that of their eldest sons. Counts of this sovereign class owed their origin to the feebleness of the later Carlovingian kings, under whom they contrived gradually to convert the provinces and towns which they had governed as royal officers into principalities hereditary in their families. It was then that the counts came to be known by the names of their counties. Since the great revolution, the title of C. in France has been purely honorary, and has been used with a licence which has almost deprived it even of that character. The title was never used in England, though its Latin equivalent has always been the common translation for Earl (q. v.), and the wife of an earl, from a very early period, has been styled *countess.* For the history of the office in Germany, where it was of great importance, see Graf.

**COUNT AND RE'CKONING**, the technical name given in the law of Scotland to a form of process, by which one party compels another to account judicially, and to pay the balance which may be found to be due. In these actions a remit is usually made to an accountant.

**COU'NTER APPROA'CH**, in Military Engineering, is a trench or passage, cut by the defenders of a fortified post from some of the outworks towards the besiegers, and leading to a battery in a small work. Its object is to enable the defenders to foil the approaches of the besiegers, by carrying the fight further away from the body of the place, and enabling the besieged to enfilade the besiegers' batteries and approaches.

**COU'NTER-CHANGED**, or **CO'NTER-CHANGED**, in Heraldry. When several metals and colours are intermixed, one being set against the other, they are said to be counter-changed.

**COUNTERFEIT.** See COINING.

**COUNTERFORT**, in Fortification, is a mass of stone or brickwork added to the revetment of a rampart, in such a way as to form a buttress for resisting the pressure of the mass of earth. Counterforts occur at intervals of about 20 feet, and assist in preventing the earth from pushing down the revetment-wall into the ditch.

**COUNTER-GUARD**, is an outwork designed to defend the two faces of a bastion or ravelin from a direct fire, so as to retard a breach being made. The C. consists of two lines of rampart parallel to the faces of the bastion or ravelin, and separated from them by a narrow ditch. The crest of the C. must be some three feet lower than that of the works it covers, in order not to obstruct the defence. Lest the enemy should establish a battery on the C., the terre-plein, or flat space behind its parapet, is made very narrow.

**COUNTER-IRRITANTS**, agents applied to the skin so as to redden (rubefacients), to vesicate (blisters or vesicatories), or to produce pustules, purulent issues, or even sloughs of skin and of the subcutaneous textures. The milder C. are mustard (see CATAPLASM), turpentine applied on warm cloths, and spirit or acetic acid in lotion. The stronger are blisters of cantharides (q. v.) or of ammonia; croton-oil (q. v.) or tartar emetic (q. v.), in ointment; setons, caustic or pea-issues, and the moxa; and above all, the actual cautery (q. v.) or hot iron. None of the stronger C. should be used without careful consideration and medical advice; great mischief is often done by their careless or improper use. C. relieve internal pain, and tend to promote the absorption of morbid effusions.

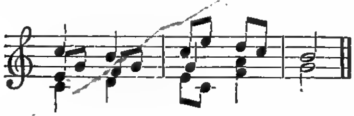
Amongst horses, C. are much used for strains and diseases of the joints, but should never be applied, as they too often are, in recent cases, or whilst the part is hot or inflamed. Cantharidine preparations, or ointment of biniodide of mercury, are the most convenient. For cows, use hot fomentations, followed by the smart infriction of mustard-paste; for dogs, soap-liniment, strengthened, if required, by ammonia or turpentine.

**COUNTERMARCHING.** See MARCHING.

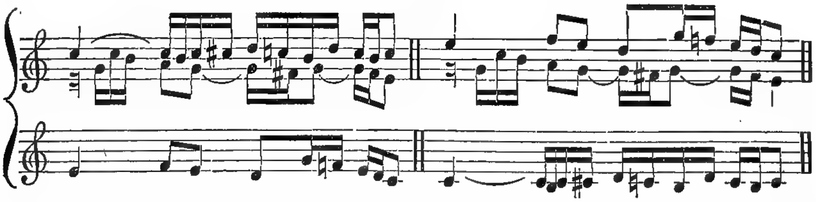
**COU'NTERMINE**, in Military Engineering, is a gallery or chamber excavated under the glacis or some other part of a defence-work of a fortress. Its purpose is to foil a besieger. In a fortress on a large scale, there are envelope galleries, counterscarp galleries, listening galleries, galleries of communication, and other subterranean passages, under various parts of the outworks, all for the purpose of assisting the defenders in discovering and frustrating plans laid by the besiegers. Listening galleries are sometimes pushed forward even to the foot of the glacis. In such places, selected men put their ear to the ground, and listen for the approach of the enemy, as denoted by the sound of tools used in driving a mine or gallery of attack. The sound of a pickaxe so employed can be heard through the ground at a distance of 60 feet. As there are no openings above, these galleries cannot be driven beyond a certain distance, as the sappers would be stifled for want of air. If a mine be driven to blow up the defence-works, a C. is driven to blow up the besiegers; and sometimes the two parties carry their works so far as to meet in the subterranean passages, and there fight. If there be only a thin wall of earth left between them, they will fire pistols through bored holes, or drive in cartridges or smoke-balls. This terrible work is mostly carried on by sappers and miners.

**COUNTER-PASSANT**, in Heraldry, when two beasts are passing each other the contrary way.

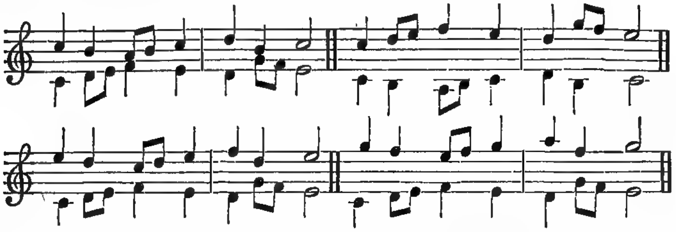
**COU'NTERPOINT**, in Music, means the setting of a harmony of one or more parts to a melody. In the early age of the science, notation was represented by mere points on the lines. The setting of parts to a melody already represented by a row of dots or points was therefore called *punctum contrapunctum.* In this respect C. is nothing else but the uniting of various harmonious parts. In a more circumscribed sense, it is the art or manner of accompanying a given melody with other parts. Simple C. is a musical combination where the melody of the parts is not mixed or changed, and may be either all in notes of the same length or of different lengths, as for example :



If the parts be constructed in regard to one another so that they can be changed, or transposed over or under each other, without alteration in the movement, or injury to the harmony, it is then called double C., for example :



As double C. consists of the changing or transposing of one part over or under another, it follows that there must be as many different kinds of it as there are different intervals in the scale. We have, therefore, double C. of the octave as above, of the twelfth, tenth, ninth, &c. That of the octave is, however, the most useful, as it is more free in movement, and easier to recognise. The following admits of different transpositions:



The first indication of contrapuntal writing is to be found in the 12th c. by Adam de la Hale, who received a genuine artistic education in the Netherlands, but was far in advance of his time, for his style of music was forbidden to be performed in the church by a bull of the pope, who gave Palestrina an order to replace it with a more simple music. The best masters for C. have been Kirnberger and Albrechtsberger in former times, and in modern times, Schneider, Hauptmann, and Dehn.

**COUNTER-PROOF.** An impression which is obtained from a freshly-printed proof of an engraving, by laying it, before the ink is dry, upon plain paper, and passing it through the press. By this means the ink is transferred from the wet proof to the plain paper, and a reversed impression is obtained, which is often of use in enabling the engraver to judge of the success of his work.

**COUNTERSCARP,** in Fortification, is the vertical or nearly vertical side of the ditch nearest to the besiegers, and opposite to the scarp or escarp.

**COUNTERSIGN,** in military discipline or manœuvres, is a word exchanged between sentinels, inspectors of posts going their rounds, or persons having business with the soldiers in camp or garrison. The C. in use at any particular time is supposed to be known only to those immediately concerned, and is generally a simple word.

**COUNTERSIGN,** the signature of a secretary, minister, or other subordinate, to any writing signed by the principal or superior, as a guarantee for its authenticity.

**COUNTER-TENOR,** the highest adult male voice, and the lowest female voice.

**COUNTER-VAIR,** a heraldic fur. It differs from *Vair* by having its cups or bells of the same tinctures placed base against base, and point against point. The tinctures are Or and Azure.

**COU'NTERVALLA'TION,** in Military Engineering, is a chain of posts constructed by the besiegers of a fortified place; it completely surrounds the place at a certain distance, and is intended to prevent sorties of the besieged. The posts are generally small redoubts, either isolated or connected by a line of earthworks. It is only during very protracted sieges that countervallations are constructed. They bear a certain relation to Circumvallation (q. v.).

**COUNTIES CORPORATE.** In England there are certain cities and towns, some having territory annexed to them, some scarcely any, which possess the privilege of being governed by their own sheriffs and other magistrates altogether independently of the counties in which they are situated. The Act 3 Geo. I. c. 5, for regulating the office of sheriff, enumerates twelve cities and five towns in this position. The cities are London, Chester, Bristol, Coventry, Canterbury, Exeter, Gloucester, Lichfield, Lincoln, Norwich, Worcester, and York. The towns are Kingston-upon-Hull, Nottingham, Newcastle-upon-Tyne, Poole, Southampton. From forming no part of the counties with which they were locally connected, they had no share in the county elections. To this extent twelve of the number are now included in their respective counties (2 Will. IV. c. 45, s. 17, schedule G).

**COU'NTRY DANCE** (Fr. *contre-danse*, of which the English term is a corruption), a dance in which as many couples can take part as there is space to accommodate them; at the commencement, the gentlemen being ranged on one side, and the ladies on the other. In its figure, the dancers are constantly changing places, leading one another back and forward, up and down, parting and uniting again. The numerous different figures, which give an interest to this dance, are generally designated with a particular name. The music is sometimes in $\frac{2}{4}$ time, and sometimes in $\frac{6}{8}$ time, and the step is more smooth than springing. The C. D. keeps its ground in England notwithstanding the introduction of many fashionable new dances. See Dancing.

**COU'NTY,** a term equivalent to shire. Although of the same signification, the terms are applied on no uniform principle. In England and Scotland, the shires are also called counties; but in Ireland, the term C. seems to be exclusively employed. Such, likewise, appears to be the case in the British colonies and United States. See Shire.

**COUNTY COURTS.** The present C. C. were established in 1846, principally for the purpose of affording a cheap and speedy mode of recovering small debts. The old C. C., kept by the sheriffs, were in most cases limited to the recovery of sums not exceeding 40*s.*, and the expense and difficulty of enforcing moderate claims often amounted to a denial of justice. There were a few local courts whose jurisdiction had a rather wider range, but in most cases there were great abuses connected with their management. The courts now take cognizance of all personal actions where the debt or damage claimed is not more than £50, except actions of 'ejectment, or in which the title to any corporeal or incorporeal hereditaments, or to any toll, fair, market, or franchise, shall be in question, or in which the validity of any devise, bequest, or limitation, under any will or settlement may be disputed, or any malicious prosecution, libel, or slander, criminal conversation, seduction, or breach of promise of marriage.' But all the actions here excluded, except actions of criminal conversation, may be tried in the C. C. by consent of the parties concerned. By similar consent, actions for any greater amount than £50 may be tried.

In England and Wales, there are 502 courts, divided into 59 circuits, and presided over by 60 judges, the Liverpool circuit possessing two. The judges are appointed by the lord chancellor, or, where the whole district is in the duchy of Lancaster, by the chancellor of that duchy. Twenty have salaries of £1500 per annum, two of £1350, thirty-eight of £1200. All judges hereafter appointed will be limited to the last-named sum. Judges resigning from permanent disability are allowed a retiring pension not exceeding two-thirds of their annual salary. Each court has a resident registrar, except in a very few cases, where officials in the old county or local courts claimed vested rights in the first appointments to C. C. offices. The registrars are appointed by the judge, but the lord chancellor, or chancellor of the duchy of Lancaster, may remove them for misconduct. Their salaries depend on the number of *plaints* entered in their districts. In courts under 6000 plaints, they vary from £120 to £1080, out of which the registrar provides a staff of clerks. Where the plaints exceed 6000, the salary is £650 and clerks; where they exceed 8000, £700 and clerks. Each court has also a high-bailiff, whose duties are outside, serving process and levying executions. In the smallest courts, their salaries may fall to about £50; in the largest, they may rise to £700 net. There are 23 treasurers, who superintend the accounts of all the courts. They are appointed and removable by the Lords of the Treasury, and their salaries are £700 and £850 per annum. All the property of the court is vested in them.

In cases above £5, and in cases of replevin and interpleader, either party to a suit may demand a jury. But this is very seldom done. Out of 3,723,840 causes tried up to December 1859, only 11,068 were tried by jury; and in 6694 instances, the person demanding the jury lost his cause. There is no right of appeal in cases where the debt is under £20; but the decisions of the court seem to be willingly accepted as final, as appeals are exceedingly rare even in the heavier causes.

There is no imprisonment for debt merely, but a defendant may be committed to prison for contumacy, fraud, or refusal to pay his debts when able to do so. Of 11,501 persons imprisoned in 1858, 728 per thousand incurred the penalty through non-appearance when summoned, and 257 per thousand for not having satisfied the judgment, having had sufficient means to do so. The average term of imprisonment actually suffered was 17 days. No defendant can be committed for more than 40 days at one time, but imprisonment does not extinguish the debt.

In the thirteen years ended December 1859, the cases annually entered for trial averaged 582,000; and those decided, 286,450. The majority of those not tried were probably settled between the parties. The courts sat 7048 days per annum—i. e., in 23 districts every day. £1,534,039 was sued for every year, and judgment obtained for £778,962. Besides this, £87,889 was annually paid into court by defendants before trial. The gross sum paid in to the credit of suitors in the whole period was nearly £6,000,000.

The C. C. have also jurisdiction in insolvency cases, where the insolvent is not a trader within the meaning of the bankruptcy statutes, and where, being a trader, or a prisoner in jail for debt, he owes less than £300. This part of their business will be greatly increased and changed if the Bankruptcy Bill, now before parliament, become law.

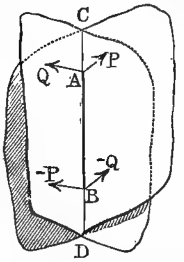
**COUNTY RATE**, a local tax levied in England and Wales, for the purpose of defraying the expenses to which counties are liable; such as the maintenance of bridges, jails, lunatic asylums, prosecutions and costs incident thereto, coroners, &c. It is levied on all property liable to be assessed for the relief of the poor. Rogue-money in Scotland, and the grand jury cess in Ireland, are the taxes most nearly resembling the English county rate. See the Poor-law Commissioners' *Report on the Local Taxes of the United Kingdom*, 1846.

**COUP** is a French word signifying 'stroke.' It is used in certain phrases that have become current in Europe. *Coup d'état*, 'stroke of state,' means an arbitrary encroachment suddenly effected by the governing authorities upon the constitution of the state, altering or setting aside the prerogatives of other parts of the body politic.—*Coup de main*, 'a stroke of the hand,' is applied, in the language of war, to a sudden and successful attack.—*Coup d'œil*, 'a stroke or glance of the eye,' is applied in speaking of persons who have the faculty of comprehending all the relations of a complicated matter at one survey; or, in art, it expresses the general effect of a picture or group at first sight.—*Coup de théâtre*, means properly a trick of the stage to produce an effect by surprise, and is hence applied to any analogous proceeding.

**COUPED** (Fr. *coupé*), in Heraldry, is used to describe the head, or any limb of an animal cut off from the trunk, and smooth. It is distinguished from *erased*, i. e., forcibly torn off, and therefore ragged and uneven. A distinction is also made between *couped* and *couped close*, the latter signifying that the head or limb is cut off close, leaving no part of the neck or trunk attached to it. When crosses, bars, bends, and the like, are cut so as not to touch the sides of the escutcheon, they are also said to be couped.

**COU'PLES**, the name given in statics to pairs of equal parallel forces acting in opposite directions, and at different points of a body. It is shewn in the art. Parallel Forces (q. v.), that when two parallel forces act in opposite directions on a body, they may be replaced by one equal to their difference acting parallel to them in the direction of the greatest, at a point *not* between but *beyond* the points where they are applied; and which point recedes the further from their points of application the nearer they approach equality, getting to an infinite distance when they become equal, and when their resultant accordingly is zero. In this limiting case, the forces constitute a couple; they have no tendency to *translate* the body; their action goes wholly to make it rotate about an axis passing through its centre of gravity, and perpendicular to the plane in which the couple acts. Such being the case, a couple cannot be replaced or counteracted by any single force, for such a force would produce translation; it can only be replaced or balanced by other couples. The length of the straight line which meets the lines of action of the forces at right angles is called the 'arm' of a couple, and the product of the force into its arm is called its 'moment.'

Most of the leading propositions in the theory of C. are readily seen to be true, as soon as they are stated. For instance, as the axis round which a couple tends to make a body rotate passes through the body's centre of gravity perpendicularly to the plane of the couple, it does not matter what position the couple occupies in its own plane. Also, supposing the body to be rigid, the couple may be moved into any plane parallel to its own, provided its new position be rigidly connected with the original position. It is also obvious, on the principle of the lever, that the efficiency of the couple depends on its moment simply, so that its arm may be shortened or lengthened at pleasure, provided the force be increased or diminished as the case may require, so as always to make the product of the force and arm the same. Suppose ropes fastened at the bow and stern of a ship pulling with equal force in opposite directions; they will make the ship turn round an axis through its centre of gravity, at a rate depending on the force applied to the ropes. If the ropes be fastened to opposite points of the vessel nearer midships, it will only turn round at the *same* rate, provided the force applied to the ropes be *increased;* and, on experiment, it would be found that the force must be increased so as that its product into the distance between the ropes shall equal the product of the force in the first case into the length of the ship. Through this we can compound C. acting in the same plane, for we can turn them round till their arms coincide, and then give them a common arm; their forces will then act in the same lines, when their resultant into the arm will be the new couple. So two C. which are situated in planes inclined at any angle to each other may be replaced by a single couple (see fig.). Suppose the C. both to be moved in their respective planes till their arms coincide with the line of intersection of the planes, CD. Bring them then to a common arm in this line, AB. At each end of this arm we shall have a pair of forces, say P and Q, inclined to one another at the angle of inclination of the planes. Their resultant, by the composition of forces, will be a force R, acting in a line between the planes. We shall have then forces R acting at each end of the arm, and evidently in directions parallel and opposite. R × arm, AB, then, is moment of the resultant couple. Having seen how to compound C. whose planes are inclined to one another, the theory of the composition of C. may be said to be complete, for if they are in parallel planes, we know we can bring them into the same plane and to a common arm, and so into a common couple. In statical theory, any number of forces acting on a body, and not in equilibrium, may be reduced to a single force, a single couple, or a single force and a single couple. We have shewn that the C. may all be reduced to one, as well as those forces which do not produce couples. If the single force do not act perpendicularly to the plane of the couple, it can always be compounded with the forces of the couple, so as to reduce the whole to a single force; if it act perpendicularly, then it cannot be compounded with the couple, and the body will have at once a motion of translation and motion of rotation.



**COU'PLET.** Any two lines which rhyme together may be called a C.; but the term is more frequently used by critics to denote two lines which contain the complete expression of an idea, and are, therefore, to a certain extent independent of what goes before or what follows. The poetic wits of the age of Queen Anne excelled in this kind of aphoristic versification. Pope, it has been said, reasons in couplets. For example:

> ''Tis with our judgments as our watches, none
> Go just alike, yet each believes his own.'

**COUPLING,** an organ register, by which two or more rows of keys can be connected by a mechanism, so that they can be played together.

**COUPON** (Fr. *couper*, to cut), a term signifying any billet, cheque, or other slip of paper cut off from its counterpart. It is, however, applied chiefly to a dividend or interest warrant, which is presented for payment by holders of debentures. Coupons in Great Britain must now be stamped.

**COURA'NT,** in Heraldry, always used for *running*, which is its meaning in French.

**COURBEVOIE,** a town of France in the department of Seine, situated on the left bank of the river of that name, about 5 miles north-west of Paris. C. has well-built houses, mostly supplied with gardens, and large barracks erected by Louis XV. Its principal manufactures are white-lead and brandy, and it has some commerce by the Seine. Pop. 5265.

**COU'RGNÉ,** a market-town of Piedmont, situated at the foot of a hill on the west side of the Orca, 12 miles west-south-west of Ivrea. It has several convents, and a population of 5600.

**COURIER,** Paul Louis, a French scholar and political writer, was born in Paris, January 4, 1772. He was educated for the army, but, without neglecting his military studies, he shewed a special predilection for ancient literature. In 1793 he became lieutenant of artillery, served in the Italian campaign 1798—1799, and in 1803 was appointed *chef-d'escadron.* After the battle of Wagram, he tendered his resignation, which was accepted. He now proceeded to Switzerland and Italy, returning to his native country in 1812. Up to this period, he was known publicly only by his translations from the classics. In 1816 he appeared for the first time as a political pamphleteer, and rapidly obtained a brilliant reputation. The piece in which he made his *début* was the *Petition aux Deux Chambres.* In 1819—1820, he published in a journal, called *Le Censeur*, a series of letters containing an exposition of his political ideas, which were those of an ardent constitutional reformer. These letters, for keenness, wit, and eloquence, have been compared to those of Pascal. His *Simple Discours* (1821) was directed against the project then entertained of purchasing Chambord for the Duc de Bordeaux in the name of the nation. It is exceedingly vigorous, clever, and sensible, and had a great success. For his audacity, he was tried and condemned to one month's imprisonment. In 1823 he published his *Livret*, a kind of memorandum-book; and in 1824 his *Pamphlet des Pamphlets*, which is finely called by Armand Carrel *Le Chant du Cygne* (the Swan's Death-song). On the 10th April 1825 he was assassinated near his own house at Veretz, in the department of Indre-et-Loire, a little before sunset. The murderer was never detected. C. was the pamphleteer of the middle class. Manly earnestness, pleasant wit, cutting irony, and admirable sense are his characteristics. Time, which generally dims the lustre of a pamphleteer's reputation, has not touched that of C., which is still as bright as ever.

**COU'RÏERS.** There are two distinct classes of couriers. The first to be noticed are employed by government to carry, securely and expeditiously, important dispatches to and from ambassadors at foreign courts. Active, and accustomed to travel, speaking several languages, and with a sufficient idea of their own consequence, they will set out at a moment's notice, pursue their way by steamer, by rail, by hired voiture, or on horseback, with little intermission by night and by day, until they reach their destination. Acquainted with routes, officials, and methods of clearing the way, and provided with all proper credentials, including a requisite supply of cash, nothing interrupts them in their eager course. Such are *Government C.*, a useful class of public servants. The other class of C. are not dissimilar in accomplishments, but their services are limited to private parties, and coming more generally into notice, we may enter more minutely into a description of their character.

*Private Couriers.*—These are usually persons of middle age, natives of Switzerland, France, or Germany, who have either been at some time gentlemen's servants, or been long employed as attendants on families while travelling on the continent. In some instances, they are of English origin, and have travelled again and again through Europe with employers who relish the dignity of having a man-servant, and dislike personal responsibility and trouble. Of whatever country, the courier has settled down into a perfectly cosmopolitan character. With equal fluency, he speaks English, French, Italian, and German, with perhaps Spanish, Portuguese, and Russian; he is acquainted with processes of getting passports and visés; knows the best routes, the best hotels, and where anything curious is to be seen. Acting for the time as a servant, he is not intrusive. Whether by railway or steam-boat, he knows his place, and makes his appearance only when he is wanted. No doubt, the courier is an expensive luxury; his usual wages being from £8 to £10 a month, independently of travelling-fares. His keep at inns is nominally paid by himself; but, of course, it weighs with the hotel-keeper in making out the bill. 'A courier, however, though an expensive luxury, is one which conduces much to the ease and pleasure of travelling, and few who can afford one will forego the advantage of his services. He relieves his master from much fatigue of body and perplexity of mind, in unravelling the difficulties of long bills and foreign moneys, sparing his temper the trials it is likely to endure from disputes with innkeepers, postmasters, and the like. If clever and experienced, and disposed to consult the comfort of his employer, he is a most useful person. His duties consist in preceding the carriage at each stage, to secure relays of post-horses; he must make arrangements for his employer's reception at inns where he intends to pass the night; must secure comfortable rooms, clean and well-aired beds, and order meals to be prepared, fires to be lighted, taking care that his master is called and the post-horses ordered at the right hour. He ought to have a thorough knowledge of everything that relates to a carriage; he should examine it at the end of each day's journey, to ascertain whether it requires any repairs, which should be executed before setting out. He should superintend the packing and unpacking of the luggage, &c. It falls to the courier to pay innkeepers and post-boys; and he ought to take care that his master is not overcharged. Besides this, he performs all the services of waiting and attendance, cleaning and brushing clothes; and he is not perfectly accomplished unless he has a smattering of the art of cookery' (Murray's *Hand-book for Travellers on the Continent*). As among ordinary domestics, there are honest and dishonest C., and it is of importance that travellers should not hire them without proper recommendations as to character. For places at which C. are to be heard of, we refer to the work just quoted, also to Bradshaw's *Continental Railway Guide*. In Paris, information respecting them will be obtained at Meurice's Hotel.

**COU'RLAND**, or **KURLAND**, a Russian government, and one of what are called the Baltic provinces, in lat. 56°—58° N., long. 21°—27° E. It was formerly an independent duchy—properly, indeed, consisting of two duchies, Courland and Semgall—and belonged, along with Livonia, to the Teutonic Knights. The difficulty of resisting the Russians led to the acknowledgment, in 1561, of the feudal sovereignty of Poland; and the last grand-master, Gotthard Kettler, secured the duchies of Courland and Semgall for his family. The country was long distracted by the contentions of two parties, one Russian and the other Polish; and after being for some time very completely under Russian influence, and the scene of many Russian intrigues, it was finally united to Russia in 1795. It contains about 10,500 square miles, with a population, in 1856, of 537,855, mostly Protestants. It is generally a level country, with ranges of low hills, and contains many lakes, bogs, forests, and downs, but some parts have a very fertile soil. The proprietors of land are mostly German; the peasantry, of Lettish or Esthonian extraction, are chiefly engaged in husbandry; there is little manufacturing industry or commerce. The capital is Mitau; but the most flourishing town is Libau.

**COURSE**, in Building, is a continuous range of stones or bricks of uniform thickness.

**COURSES**, on shipboard, is a name given collectively to all the lower sails; above them is the group of topsails; and, highest of all, the group of top-gallant sails. The C. comprise the mainsail, foresail, main-staysail, fore-staysail, and mizen-staysail.

**COURSING**, a method of hunting hares by greyhounds, in which the dogs follow the game by *sight*, instead of by *scent*. C. is of very ancient date, having been practised by the Greeks. Within the last twenty years, however, its popularity as a sport has greatly increased, and the breed of the greyhound is now studied with nearly the same care and zest as that of the race-horse. The method pursued in C. is briefly as follows:

Meetings are held in open districts, well frequented by hares, where the greyhounds—technically called 'dogs,' as foxhounds are technically called 'hounds'—are entered by their owners for a variety of stakes, which are to be competed for—C., in this respect, partaking of the nature of a race between horses. The first thing done is to select a judge to decide upon the merits of the best dogs; second, a 'slipper' is appointed to hold the dogs in leash, and start them at the hare; and, third, a flag-steward is chosen, who remains near the judge and announces the colour of the victorious dog by means of a red or white flag, according as the competitors are arranged. The next thing done is to 'beat' the field for a hare. When one is found, the judge usually allows it 80 or 100 yards 'law' before he cries to the 'slipper' to let the dogs 'go.' Upon the word 'go,' the 'slipper' liberates the animals by a spring attached to the 'slips'—i. e., the long strong cord held by the 'slipper' and communicating with the leathern collars fixed round the necks of the dogs. The judge's duties now begin in earnest. He follows the dogs wherever they go, calculating carefully the number of 'points' made by each—a 'point' being any meritorious achievement on the part of the dogs (as when the one outstrips the other at any time, or turns the hare, i. e., causes it to 'double'); and at last he adjudges the victory, not *necessarily* to the dog which has killed the hare, but to the one which has made the most points during the course, i. e., which has exhibited the finest qualities of speed, sagacity, endurance, &c.

**COURT** (Fr. *cour*, Ital. *corte*, from Lat. *cohors* or *chors*, *chortis*, an enclosure or cattle-yard; allied to Polish *grod*, a city; Sw. *gard;* Eng. *yard* and *garden*) was originally applied to the square or space enclosed by the buildings of a feudal castle; and hence it came to denote the persons immediately surrounding a feudal chief or superior. Its application is now confined to the residence and surroundings of sovereign princes. In England, and in other free countries, when we speak of 'the court,' we mean little more than the family and attendants of the sovereign, viewed not in a private, but a public capacity. See ROYAL HOUSEHOLD. The bishops and nobles, the ministers of the Queen for the time being, and other persons entitled to precedence, either on hereditary, official, or personal grounds, are those who habitually encircle the sovereign; and 'the court circle,' consequently, means those persons of distinction, and their families, who are in the habit of approaching the Queen, and of associating with the other members of the royal family. But this circle is one the circumference of which is marked by no absolute line, like that which in France, under the old monarchy, divided the C. from the city.

**COURT, PRESENTATION AT.** The honour of being presented at C., or introduced to the sovereign, is only to be obtained by persons of respectable position, and is a thing sought after not only for the *éclat* of the ceremonial, but as giving a certain stamp of character; for, having been received by the sovereign, a person may with justice expect to be received anywhere. Valuable so far as a credential, a reception at C. is carefully guarded from abuse. At the C. of her Majesty, Queen Victoria, there is a scrupulous and very proper exclusion of all parties, male or female, of damaged reputation. Those who aim at the distinction of being presented at C. belong chiefly to what are called the higher circles—nobility and landed gentry; officers in the army, navy, and higher departments of the civil service; judges, magistrates, church-dignitaries, members of the learned professions; and the wives and daughters of these respective classes. Men of scientific, literary, or artistic attainments do not generally attempt to appear at C., and neither, of course, do the classes engaged in trade. It is usual to be presented on taking office, or on attaining some personal dignity, or on arriving from an important and distant expedition. Young ladies of good family are said 'to come out,' on being presented at court. What perhaps contributes more than anything else to secure selectness, is the obligation of appearing in 'court-dress,' an expensive and somewhat fantastic costume of old date; from which only those who assume professional uniforms are exempted. As is well known, the court-dresses of ladies are superb. It will thus be seen that the notions prevailing among foreigners arriving in England—those from the United States in particular—as to the practicability of indiscriminate presentation at C., are erroneous. It is the duty of the Lord Chamberlain at St James's to furnish information regarding the steps to be adopted by those who desire to be presented at C., either at levées, which are restricted to gentlemen, or at drawing-rooms, which are chiefly, though not exclusively, intended for ladies. The days on which these receptions take place are advertised in the newspapers some days before, with the necessary directions for preventing confusion. Her Majesty's birthday is the occasion on which the greatest reception of the year takes place, but there are no new presentations on that day. Any British subject who has been presented at C. in England, can claim to be presented by the British ambassador at any foreign court. Those who wish to be mere spectators, can obtain tickets to the corridor, where they see the company passing in and out, by applying to the Lord Chamberlain. For this purpose, however, an introduction is required. It is indispensable that the names of gentlemen desiring to be presented, and of the nobleman or gentleman who is to present them, be sent to the Lord Chamberlain's office several days previously, in order that they may be submitted for the Queen's approbation. Gentlemen are also requested to bring with them two large cards, with their names clearly written upon them, one of which is left with the Queen's page in the presence-chamber, and the other is delivered to the Lord Chamberlain, who announces the name to her Majesty. The same rules apply to ladies. Lists of presentations appear next day in the principal London newspapers.

**COURT BARON.** See COMMON LAW, COURTS OF.

**COURT OF COMMON PLEAS.** See COMMON LAW, COURTS OF.

**COURT OF SE'SSION**, the highest civil tribunal in Scotland, was instituted in the reign of King James V., by statute dating 17th May 1532. The object of its institution was to discharge the judicial functions which originally belonged to the king and his council, and which, since 1425, had in a great measure devolved on a committee of parliament, as the great council of the nation. The C. of S. consisted at first of 14 ordinary judges and a president. One half of these judges and the president were churchmen, and the practice of appointing ecclesiastics to the bench did not cease for some time even after the Reformation. The king had the privilege of appointing, in addition to the ordinary judges, three or four peers or members of his great council, to sit and vote with the Lords of Session. When the Lord Chancellor (see CHANCELLOR OF SCOTLAND) was present, he was president of the Session. His office was abolished at the Union, and the habit of appointing peers gradually fell into disuse, though, when a peer chances to be present, he is still, as a mark of courtesy, accommodated with a seat on the bench. From its foundation, till 1808, the C. of S. consisted of one court; in that year it was divided into what are known as the First and Second Divisions, two separate courts possessing co-ordinate jurisdiction. The Lord President is still president of the whole court when called together for consultation, and enjoys other privileges in that capacity; but on ordinary occasions, he officiates simply as president of the First Division. In 1810, another very important change was made. The First Division up to this time had consisted of 7, and the Second Division of 6 ordinary judges, the latter being presided over by the Lord Justice-clerk (q. v.), as the former was by the Lord President. The three junior judges were now taken from the First Division, and the two junior judges from the Second, and appointed to sit as permanent Lords Ordinary in the Outer House. The quorum, which had formerly been four, was now reduced to three in both Divisions. In 1830, the number of judges in the C. of S. was reduced to 13; and the present staff consists of the Lord President, the Lord Justice-clerk, and 11 ordinary judges. Of the five Lords Ordinary, four only sit daily, the fifth enjoying what is called his 'blank day.' The Outer House is the supreme court of the first instance in Scotland, and its judgments, with a few statutory exceptions, are appealable to the Inner House. The youngest judge, or junior Lord Ordinary, officiates in a separate department of the Outer House, called the Bill Chamber (q. v.), where summary petitions, and other branches of business peculiarly requiring dispatch, are disposed of. This department alone is open during the vacations of the court, the judges, with the exception of the Lord President and Lord Justice-clerk, officiating in it in rotation. Either Division of the C. of S. may call in the aid of the other when equally divided in opinion (13 and 14 Vict. c. 36, s. 25). In cases of still greater difficulty, the Lords Ordinary are also called in, and a hearing before the whole court, or *in presence*, as it is called, takes place. The judges of the C. of S. are appointed by the crown, and hold their offices for life. No one is eligible to the office unless he has served as an advocate or principal clerk of session for five, or as a writer to the signet for ten years. Practically, none but advocates are appointed. No action for debt can originate in the C. of S. in which the interest of the pursuer is less than £25. With few exceptions, the judgments of all the inferior courts of Scotland are reviewable by the C. of S., but this rule does not apply to the small-debt courts. The judgments of the C. of S. may be appealed to the House of Lords within two years after they have been pronounced.

**COURTALLUM**, a town of the district of Tinnevelly, in the presidency of Madras, stands in lat. 8° 56′ N., and long. 77° 20′ E., near the junction of the Eastern and Western Ghauts. Open towards the east, at a height of 700 feet above the sea, it is elsewhere embosomed in hills, having, in its immediate neighbourhood, a deep glen which affords easy communication between the opposite shores of Hindustan. The place is a favourite retreat for invalids, deservedly enjoying a reputation for salubrity of air, richness of vegetation, and beauty of scenery. The indigenous flora comprises 2000 species, and many exotics, such as the nutmeg, clove, and cinnamon, have been introduced with success.

**COU'RTESY, or CURTESY**, in Law, is the life interest which the surviving husband has in the real or heritable estate of the wife. It is remarkable that, both in England and in Scotland, this customary right should be regarded as a national peculiarity—that in England it should be called the C. of England, and in Scotland the C. of Scotland—whereas it is well known to be peculiar to neither of them. Traces of it are to be found in a constitution of the Emperor Constantine (Code 6, 60, 1); and there can be no doubt that it had found a place, with all the peculiarities which now belong to it, in the *coutume* of Normandy, from whence there is every reason to think that it was transferred to England (Barnage, vol. ii. p. 60; Stephen's *Com.* vol. i. p. 264; Fraser's *Domestic Relations*, i. p. 635). The four circumstances which are requisite to make a tenancy by C. in England are—marriage, seizin of the wife, living issue, and the wife's death. The rule that the child must have been heard to cry, which at one time was followed in England, is still adhered to in Scotland. It is not necessary, however, in either country, that the child survive; it is enough that it was once in existence, although it should have died immediately after its birth. In both countries, the child must be the mother's heir, and it is consequently said that C. is due to the surviving husband rather as the father of an heir than as the widower of an heiress. By 19 and 20 Vict. c. 120, which enables tenants for life of *settled* estates (see SETTLED ESTATE) to make effectual leases for twenty-one years, subject to the exceptions and provisions in the act contained, a similar power is also conferred upon tenants by the C. of *unsettled* estates (Stephen, i. p. 267). As to the law of Scotland on the point, see Hunter on Landlord and Tenant, i. p. 119.

**COURTESY TITLES.** Titles of honour (q. v.) are imparted by the sovereign or other competent authority. Independently of these, there are C. T. assumed by or given to individuals, and which have no validity in law. The term C. T. is best known in connection with the titles given by popular consent to the sons and daughters of certain peers. English dukes, marquises, earls, and viscounts have several titles, accumulated by distinct patents in their progressive steps in the peerage. Thus, a duke may at the same time be a marquis, an earl, a baron, and a baronet; a marquis may be also an earl, &c.; and an earl is almost always a baron. In ordinary parlance, they respectively take only their highest title. One of the inferior titles so set aside is permitted, as a matter of social dignity, to be assumed by the eldest son. For example, the Duke of Bedford being also Marquis of Tavistock, his eldest son takes the title of Marquis of Tavistock; and the Duke of Buccleuch and Queensberry being also Earl of Dalkeith, his eldest son takes the title of Earl of Dalkeith. When it happens that the inferior title is of the same name as the first, there is a somewhat different usage. For example, the Earl of Gosford being also Viscount Gosford, his eldest son, to prevent confusion, takes only the family surname, Acheson, with the prefix Lord—Lord Acheson. The younger sons of dukes and marquises have the courtesy title of Lord prefixed to their Christian and surname: as, for example, Lord William Lennox, a younger son of the Duke of Richmond; or the well-known statesman, Lord John Russell, a younger son of the Duke of Bedford. The eldest son of an earl, when not a viscount, takes his father's second title of Lord: as, for example, the eldest son of the Earl of Wemyss is styled Lord Elcho. A proper understanding of these conventional customs will serve to clear up some of the perplexities into which foreigners are apt to become involved in thinking of our highly artificial social system. It is to be kept in mind, that titles by courtesy do not raise their bearers above the rank of commoners; and that, consequently, they are eligible for election as representatives to the House of Commons. Very many of the peers, indeed, begin their political career as county or borough representatives under their C. T.; serving in this way a kind of apprenticeship as statesmen before they are advanced, by the decease of their fathers, to the House of Lords.

The daughters of dukes, marquises, and earls have the title Lady prefixed to their Christian and surname; and in the event of their marrying a person of inferior rank, they retain the title Lady with their Christian name, adding the surname of their husband. Yet, these are but courtesy titles. The only valid title they can claim in virtue of their birth, is the prefix Honourable, which is applicable alike to the sons and daughters of peers. The wives of baronets receive the courtesy title of Lady; their lawful designation being Dame. Ladies who have had a title by a first marriage, retain it as a matter of courtesy when they are married a second time, though the alliance be with a person without a title—a circumstance sometimes leading to a certain awkwardness in designation. In Scotland, the eldest son of a baron has the courtesy title of Master. For example, the eldest son of Lord Elibank is styled Master of Elibank.

The title Right Honourable is given in some few instances by courtesy to officials, as in the case of the Lord Advocate for Scotland. The judges of the Court of Session in Scotland, on first taking their seat on the bench, assume the courtesy title of Lord along with their own surname or a territorial title. But such titles are used only senatorially. In writing, the real name is subscribed. The titles of Mr or Master and Esquire (q. v.), are now given by courtesy to nearly all classes of persons. For an exact definition of titles by courtesy as applicable to members of the peerage, we refer to the *Secretary's Assistant*, London, 1831.

**COU'RT-FOOL.** From very ancient times there existed a class of persons whose business it was to while away the time of the noble and wealthy, particularly at table, by all manner of jests and witty sayings. Alexander the Great, Dionysius of Syracuse, Augustus and his successors, maintained such jesters. It was, however, during the middle ages that this singular and repulsive vocation became fully developed, and that the office of jester or fool became a regular and indispensable court office. The symbols of such a personage were—the shaven head; the fool's cap of gay colours, with asses' ears and cock's comb; the fool's sceptre, which was variously formed; the bells, which were mostly attached to the cap, but likewise to other parts of the dress; and a large collar. The rest of the costume was regulated by the taste of the master. Of these professional fools, some obtained a historical reputation, as Triboulet, jester to King Francis I. of France, and his successor, Brusquet; Klaus Narr, at the court of the Elector Frederic the Wise of Prussia, whose jests have been repeatedly printed; and Scogan, court-fool to Edward IV. of England. The kings and regents in Scotland had their jesters, as was usual in their time; and the sarcastic sayings of some of these privileged personages—such as those of Patrick Bonny, jester to Regent Morton—are still remembered among the national *facetiæ*. English court-jesters died out with the Stuarts; one of the last of the race being the famous Archie Armstrong, whose death took place characteristically, on April 1, 1646. Besides the regular fools recognised and dressed as such, there was a higher class, called merry counsellors, generally men of talent, who availed themselves of the privilege of free speech to ridicule in the most merciless fashion the follies and vices of their contemporaries. Of these, Kunz von der Rosen, jester to the Emperor Maximilian I.; John Heywood, a prolific dramatic poet and epigrammatist at the court of Henry VIII.; and Angely, a French courtier, were particularly distinguished for talent and wit. In all times, there existed at courts persons who, without becoming jesters by profession, were allowed the privilege of castigating the company by their witty and satirical attacks, or who served as the general butts. Among these were, on the one hand, the Saxon general Kyaw, celebrated for his blunt jests; and on the other, the learned Jacob Paul, Baron Gundling, whom Frederic William I. of Prussia, to shew his contempt for science and the artificial court system, loaded with titles. An interesting history of the whole subject was written by Flögel, entitled *Geschichte der Hofnarren* (Liegn. and Leips. 1789). Such a history forms a kind of barometer of the manners and morals of courts at different times. At a later period, imbecile or weak-minded persons were kept for the entertainment of the company. Even ordinary noblemen considered such an attendant indispensable; and thus the system reached its last stage, and towards the end of the 17th and beginning of the 18th century, was finally abolished. It survived longest in Russia, where Peter the Great had so many fools that he divided them into distinct classes.

Court-fool and Buffoon.
From Harleian MS., fourteenth century.

**COU'RT-HAND**, a name given in England to the old, Gothic, or Saxon handwriting, as distinguished from the modern or Italian handwriting. The old way of writing continued to be used in the law-courts after it had been superseded elsewhere, and hence its name of Court-hand.

**COURT-MA'RTIAL**, a court for the trial of any one belonging to the army or navy, for some breach of military or naval law. The members of the court fill the functions both of judge and jury. In the British army, courts-martial are *general, district*, or *regimental*. The first is the only one of the three empowered to award death or transportation for life, as a punishment to the offending person. It consists of thirteen commissioned officers, if so many can be obtained at the time and place; and a deputy judge-advocate is specially appointed to preside. A non-commissioned officer, or a private, may be tried by any one of the three kinds of court; but a commissioned officer only by a general court-martial. A *district* or *garrison* C. may be convened by a field-officer commanding a district or corps, without requiring the sovereign's sign-manual. It consists of a number of members, varying from three to seven, with a captain or higher officer to act as president or deputy judge-advocate. Such a court tries warrant officers, non-commissioned officers, and rank and file; and can only treat such offences or alleged offences as meet with secondary punishment. A *regimental* C. may be convened by the commanding officer of a regiment or detachment; it consists of three or more members, with a captain as the president; it treats of minor offences, and can award only minor punishments.

In all these kinds of C. the members are sworn in; the court is an open or public one; the vote or sentence is decided by majority, the junior members voting first; but two-thirds of the whole number, in a general C., are necessary to give validity to a sentence of death.

Sometimes *Courts of Inquiry* are held instead of a C., not to try or to punish, but to make an investigation; the members not being on oath. Such a court occasionally precedes a court-martial. A celebrated court of this kind was held in Chelsea Hospital after the Crimean war, to inquire into the conduct of certain officers; but this was *not* followed by a court-martial.

*Naval* courts-martial consist of admirals, captains, and commanders, who try for offences against the naval articles of war. The chief admiral of the fleet or squadron appoints the members; but all captains have a *right* to sit, if not implicated. The C. is open to all the crew and others as spectators.

**COURTRAI** (Flemish, *Kortryk*), a town of Belgium, in the province of West Flanders, about 30 miles south of Bruges, lat. 50° 49′ N., long. 3° 18′ E. C., which is built on both sides of the Lys, is surrounded with walls, and has a castle, a citadel, a fine old bridge flanked with Flemish towers, a noble town hall, and a beautiful Gothic church, founded in 1238 by Baldwin, Count of Flanders. Though a busy manufacturing place, C. is nevertheless very clean. Table damask and other linen are the principal articles of manufacture. There are extensive bleaching-grounds in the vicinity, and the neighbouring plains supply fine flax in large quantities to many European markets. Pop. 22,500. In 1302 the Flemings, citizens of Ghent and Bruges chiefly, won a splendid victory over the chivalry of France beneath the walls of C., more than 700 gilt spurs (worn only by French nobles) being afterwards gathered from the dead by the victors. The battle was hence named 'the Battle of the Spurs.'

**COU'RT-YARD.** See Farm Steading.

**COUSIN**, Victor, the founder of systematic eclecticism in modern philosophy, was born in Paris, November 28, 1792. He studied with brilliant success at the *Lycée Charlemagne*. In 1812 he was appointed Greek tutor in the *Ecole Normale*, and in 1814, Examiner in Philosophy. In the following year he became assistant-professor to Royer-Collard at the Sorbonne, and threw himself heartily into that reaction against the sensualistic philosophy and literature of the 18th c., which was then the order of the day. Following the path of his senior, he became an exponent of the doctrines of the Scotch metaphysicians, but exhibited far more brilliancy, energy, and warmth of expression than the original authors of these doctrines. In 1817, C. visited Germany, where he was introduced to bolder and more speculative systems of philosophy than any he had yet known. He studied successively, or at the same time, Plato, Kant, Jacobi, Fichte, and Schelling. A second visit to Germany, in 1824—1825, had also important consequences. Suspected of carbonarism, he was arrested at Dresden by the police, and sent to Berlin, where he was detained for six months. He took advantage of his compulsory residence in the capital of Prussia to study the philosophy of Hegel, which exercised considerable influence on his susceptible intellect. On his return to France, he took a decided stand against the reactionary policy of Charles X.; and in 1827, when the comparatively liberal ministry of Martignac came into office, C., who had for some years been suspended from his professorial functions, was reinstated in his chair. Meanwhile, C. had appeared as an author. During 1820—1827, he published his editions of Proclus and Descartes, and part of his celebrated translation of Plato, which was finished in 1840, in 13 vols. The year 1828 witnessed the most splendid triumph in the career of C. as a philosophic teacher. It is said that to find an audience as numerous, and as passionately interested in the topics discussed, as gathered round C., it would be necessary to go back to the days of Abelard and other medieval teachers of philosophy. C. was still young, simple, and pure in his habits; his doctrines were for the most part new to his hearers, bold, and in harmony with the spirit of the time. The finest qualities of the national genius appeared in his lectures, a wonderful lucidity of exposition, an exquisite beauty of style such as no modern or ancient philosopher, excepting Plato, has equalled; a brilliancy of generalisation and criticism that enchanted every one; and a power of co-ordinating the facts of history and philosophy in such a manner as to make each illustrate the other, and reveal their most intricate relations. At this period, C. was one of the most influential leaders of opinion among the educated classes in Paris; and consequently, after the revolution of 1830, when his friend Guizot became prime-minister, C. was made a member of the Council of Public Instruction; in 1832, a peer of France; and later, Director of the *Ecole Normale*. His efforts for the organisation of primary instruction are to be seen in those valuable reports which he drew up, from personal observation, on the state of public education in Germany and Holland. In 1840, he was elected a member of the *Académie des Sciences Morales et Politiques*, and in the same year became minister of Public Instruction in the cabinet of Thiers. The revolution of 1848 found in C. a friend rather than an enemy. He aided the government of Cavaignac, and published an anti-socialistic brochure, called *Justice et Charité*. Since 1849 he has disappeared from public life.

It is more easy to state what philosophical doctrines have received exposition at the hands of C., than to determine precisely what are his own. At first a disciple of Royer-Collard and the Scotch school, he was attached to the psychological method of investigation; afterwards a keen student of the German school, he expounded the views of Schelling with such copious enthusiasm, that he might legitimately enough have been considered a thorough Pantheist. Recently, judging from such a book as *Du Vrai, du Beau, et du Bien* (1853), he seems more disposed to regard philosophy in its religious and æsthetic relations. See Eclecticism.

C.'s chief works (besides those already mentioned) are *Fragments Philosophiques* (1826), *Cours de l'Histoire de la Philosophie* (1827), *Ouvrages inédites d'Abelard* (1836), *Cours d'Histoire de la Philosophie Moderne* (1841), *Cours d'Histoire de la Philosophie Morale au XVIIIe Siècle* (1840—1841), *Leçons de Philosophie sur Kant* (1842), *Des Pensées de Pascal* (1842), *Etudes sur les Femmes et la Société du XVIIe Siècle*, &c. (1853). C. has also contributed a great variety of papers to the literary and philosophic Reviews of France.

**COU'SINS**, First. See Marriage.

**COUTANCES**, a town of France, in the department of La Manche, at the confluence of the Soulle and Bulsard. It is built on a conical hill, a few miles from the English Channel, and is a somewhat lugubrious place. Its cathedral, however, is one of the finest specimens of ecclesiastical architecture in the early pointed style in Normandy. One of the towers of the edifice is lighted up with a lantern, that serves as a beacon for ships navigating the channel. C. has manufactures of druggets, muslins, &c., and a trade in corn. Pop. 7100.

**COUTHON**, Georges, a fanatic of the French Revolution, was born in 1756 at Orsay, near Clermont, in Auvergne. At the outbreak of the Revolution, he was engaged as an advocate, and in 1790 was elected president of the Tribunal for the district of Clermont. In 1791, he was sent by his fellow-citizens to the National Convention, where he made himself conspicuous by his furious hatred of the court, the priesthood, and the monarchy. In spite of an infirmity which prevented him using his limbs, C. soon became very influential from the rabid violence of his sentiments. He voted for the death of the king without delay or appeal to the country, and (after a brief relapse into moderatism) became a devoted and bloodthirsty partisan of Robespierre. In July 1793, he was appointed a member of the *Comité de Salut Public*, and along with Châteauneuf-Randon and Maignet, was sent against the Lyonnese insurgents. After some opposition, the city was taken, when a multitude of the citizens were put to death. On his return to the Convention, he became quite maniacal, demanding the 'impeachment' of all the kings of the earth, and voting for Pitt being declared 'the enemy of the human race,' and the English nation a 'traitor to humanity.' The fall of Robespierre brought down C. also. Accused by Fréron, he was thrown into prison, delivered by the mob with whom he was popular, recaptured by the soldiers of the Convention, and executed 28th July 1794, along with St Just and Robespierre.

**COUTRAS**, a town of France in the department of Gironde, situated on the left bank of the Dronne, about 26 miles north-east of Bordeaux. C. has a considerable trade in flour, and the district produces red wine; but the place is known principally on account of the bloody victory gained here (1587) by Henry of Navarre over the forces of the League. In this battle the Duc de Joyeuse, commander of the Leaguers, was slain, as well as many other great noblemen on the same side. Pop. 1785.

**CO'VENANT**, in English Law, an agreement by *deed* (q. v.). In the common law-courts, a special form of action is appropriated to the enforcement of a C. called an Action of Covenant. But in many cases it may also be enforced by the form called an Action of Debt. A C. may also be *implied*. 'Covenant running with the land,' is a C. affecting the land into whosesoever hands it comes.

**COVENANT** (Lat. *convenire*, to come together), a contract or agreement; a term much used by theologians, and in its ordinary signification, as well as in its theological use, nearly if not always exactly equivalent to the Hebrew *berith* of the Old Testament and the Greek *diathēkē* of the New. Applied to relations established between God and men, the term C. must be understood with a certain modification of the meaning which it bears when employed concerning the relations of men to one another, when two independent parties enter into a C., which they have equal right to make or to refuse to make; and is sometimes employed as equivalent to *dispensation*, and the Jewish dispensation is called the *Old* C. (or *testament*, by another translation of *diathēkē*), in contradistinction to the Christian, which is called the *New*. God, in his supremacy, is regarded as appointing certain conditions for his creatures, which they cannot but accept, yet their willing consent to these conditions gives to the relation established the nature of a C.; and thus God is commonly said to have made two covenants with man: the *first C.*, or *C. of Works*, with Adam, as the representative of the whole human race, promising life (with perfect happiness), upon condition of perfect obedience, whilst death was threatened as the penalty of transgression; the *second C.*, or *C. of Grace*, being that on which depend the whole hope and salvation of man, since the first C. was broken, and in which life is freely offered to sinners, and they are simply required to believe in Jesus Christ that they may be saved. This C. God is regarded as having made with Christ, as the representative of his people, and with them in him. The older theologians often speak of the *C. of Redemption* between God and Christ, employing the term *C. of Grace* rather to designate the whole dealings of God with men in giving effect to the C. of Redemption; but the term *C. of Grace* has long been almost universally employed to include all that was comprehended under both terms. The *Abrahamic C.* is the C. of Grace as declared to Abraham, in its particular relation to him and his seed. God is represented in Scripture as sustaining a *C. relation* to his *own people*, to the Jews under the Old C., to believers in Christ under the New; and doctrinal theology consists not a little in tracing out the nature of this relation, and the consequences which flow from it. As the people of God collectively sustain a C. relation to him, so do believers individually; and it has not been an uncommon thing for pious persons to endeavour to reduce to writing their sense of this '*C. obligation*,' under the notion of a *personal covenanting* with God; and of binding themselves by a stronger obligation to what they believed to be good and their duty. It has also been common for men, from the earliest ages, to enter into covenants with one another with more or less of religious solemnity; and this has in particular been done among those who have suffered persecution, or have been engaged in contests concerning matters of religion, for which the authority of certain passages of the Old Testament is strongly pleaded. Instances occur in the history of the Waldenses, and of some of the Reformed churches, particularly in the history of the Reformation in Scotland. But the most memorable covenants in Scottish ecclesiastical history belong to a period subsequent to the Reformation.

**COVENANTS, The**, known in Scottish history and tradition, are chiefly two in number—the National Covenant, and the Solemn League and Covenant. As it is necessary to discriminate between these, we shall speak of them separately.

National Covenant.—This was a bond of union or agreement, drawn up at Edinburgh in 1638, by the leading Presbyterian ministers, and subscribed by vast numbers of persons of all ranks of life. It embodied the Confession of Faith of 1580 and 1581, subscribed by James VI. in his youth, and again recognised in 1590 and 1596; and was binding on all who signed it to spare nothing which might save their religion. The proximate cause of this extraordinary manifestation of feeling was the attempt of Charles I. to enforce Episcopacy and the use of the Service-book in Scotland. The subscribing of the National Covenant began on the 28th of February 1638, in the Greyfriars' church and churchyard, at Edinburgh. Numerous copies were also circulated through the country for signature—a circumstance which accounts for many copies being still extant. 'In the Library of the Faculty of Advocates at Edinburgh are preserved five parchment copies, with the original signatures of Rothes, Montrose, Loudon, and many others of the nobility, gentry, commissioners of counties and burghs, and ministers, though only one of these five copies is apparently connected with the first signing, and the other four, which are dated 1639, were subscribed after the ratification by the General Assembly.'—*Historical Sketch Illustrative of the National Confession of Faith* (Davidson, Edinburgh, 1849), to which we refer for a variety of details. The General Assembly, which met at Glasgow, November 21, 1638, ratified the National Covenant and the Confession of Faith which it embraced, and deposed the whole of the hierarchy which had been established by Charles I. The National Covenant was subsequently ratified by the 5th act of the second parliament of Charles I., held at Edinburgh June 11, 1640, and subscribed by Charles II. at Spey, June 23, 1650, and Scoon, January 1, 1651. The document will be found in the volume which comprehends the *Westminster Confession of Faith*, in use by the Church of Scotland. Those who subscribe the National Covenant, promise to 'continue in obedience of the doctrine and discipline of this kirk.' They also give assent to various acts of parliament in the reign of James VI., which, besides repudiating the jurisdiction of the pope, and all the ceremonial observances and errors of the Romish Church, ordain 'all sayers, wilful hearers, and concealers of the mass, the maintainers and resettors of the priests, Jesuits, trafficking Papists, to be punished without any exception or restriction.'

Solemn League and Covenant.—This was a document of date four to five years later than the

National Covenant, since the signing of which, Charles I. had broken with the English parliament, set up his standard at Nottingham (August 1642), and from his various successes, it was thought he might finally be able to reinstate Episcopacy in Scotland. With some alarm on this ground, the Scotch willingly received overtures from commissioners deputed from the English parliament. Hopes were held out to the Scottish nation, that in the event of success against the king, the Presbyterian model should supersede the Episcopalian both in England and Ireland. Approving of a measure of this kind, the Scottish Estates entered into what was called a Solemn League and Covenant with the English parliament. One of the provisions of the bond of agreement was, that the Scotch should send an army into England against the king, which they did in January 1644.

The Solemn League and Covenant was subscribed by many of all ranks in Scotland and England, including the Assembly of Divines at Westminster, was ratified by the General Assembly at Edinburgh, August 17, 1643, and the Scottish parliament, July 15, 1644; and subscribed by Charles II. at Spey, 1650, and Scoon 1651. Like the National Covenant, it has, till the present day, a place in the volume which comprehends the *Westminster Confession of Faith* of the Church of Scotland. While the National Covenant refers to the observance of the Presbyterian polity within Scotland alone, the Solemn League and Covenant is much more comprehensive. Those who subscribe it, setting out with a profession of attachment to the Church of Scotland, are to endeavour to bring about a uniformity in religion and church-discipline in the three kingdoms; and further—'That we shall in like manner, without respect of persons, endeavour the extirpation of popery, prelacy (that is, church-government by archbishops, bishops, their chancellors, and commissaries, deans, deans and chapters, archdeacons, and all other ecclesiastical officers depending on that hierarchy), superstition, heresy, schism, profaneness, and whatsoever shall be found to be contrary to sound doctrine and the power of godliness, lest we partake in other men's sins, and thereby be in danger to receive of their plagues; and that the Lord may be one, and his name one, in the three kingdoms.'

Such were the famous Covenants, at one time enforced by civil penalties, and for which their adherents, under the name of Covenanters, fought and suffered in Scotland, between the Restoration and Revolution, maintaining to the last that both Covenants, notwithstanding certain rescissory acts of parliament, were still binding on the whole nation. At the Revolution, the two Covenants were set aside, and cannot be said to have now any practical effect in any part of the United Kingdom. As above stated, they have a place in the volume which comprehends the *Westminster Confession of Faith*, but for what reason, it is difficult to say; for the Church of Scotland does not make adherence to them obligatory on either clerical or lay members. Certain Scottish and Irish dissenters, however, still profess attachment to the Covenants, and on particular occasions renew their subscription of them. See CAMERONIANS. The obligations undertaken by the sovereign, and the modern acts of parliament abolishing religious tests on taking civil office, and admitting Roman Catholics, Nonconformists, and Jews to parliament, not to speak of public opinion, are totally at variance with the Covenants. It is customary in popular lectures on the Covenanters to overlook the fact, in compassion for their sufferings, that they contended for what is now quite adverse to the principles of religious toleration. Yet, in so far as the manful struggle in which they were concerned helped to accelerate the Revolution, the history of the Covenanters must ever be associated with that of civil and religious liberty. W. C.

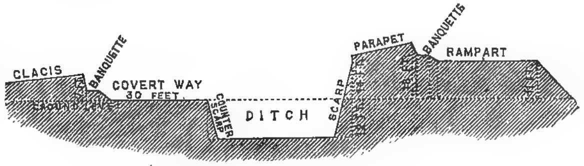
**CO'VENT GA'RDEN** (properly *Convent Garden*, from having been originally the garden of Westminster Abbey) is a square in London celebrated for its great market of fruit, vegetables, and flowers. In the 17th c., C. G. was a very fashionable quarter of the town—the residence of many eminent persons. The scene of one of Dryden's plays is laid here, and frequent allusions are made to the place in plays of Charles II.'s time. The market, now so famous, appears to have originated about 1656 in a few wooden sheds and stalls. C. G. is for a stranger one of the sights of London, and is seen to greatest advantage about three o'clock on a summer morning; Tuesday, Thursday, and Saturday being the principal days.

**CO'VENTRY** (Convent Town), a city, parliamentary and municipal borough, and manufacturing town in the north of Warwickshire, on the Sherbourne, an affluent of the Avon, 18½ miles east-south-east of Birmingham. It stands on a gentle eminence in a valley, with a ridge of hill on the south, and contains many old houses, with timbered fronts, projecting into narrow streets, and belonging to the 15th and 16th centuries. The modern part of C., however, is well, though not regularly built. The chief buildings are the churches, with imposing spires. St Michael's Church, built 1313—1395, is said to be the largest parish church in England, and is one of the noblest of the lighter Gothic structures. St Mary's Hall, built 1450, for the Guild, is one of the finest specimens of ornamental work in England, with grotesque carved oak roof, ancient tapestry, and great painted window. In the market-place formerly stood a rich hexagonal Gothic cross, 57 feet high, erected in the 16th c., in three stories, with exquisitely finished pillars, pinnacles, and niches, with statues of English kings and saints. Before the year 1760, the cross had fallen to decay, and in 1771, the remains of it were taken down and removed. The ancient walls, three miles in circuit round C., were demolished by Charles II. Pop. (1861) of municipal borough, 40,937. C. returns two members to parliament. The chief manufactures are ribbons and watches. There are large silk-dyeing works. C. is nearly in the centre, between the four great English ports, London, Bristol, Liverpool, and Hull, and has extensive canal communication with other parts of the country. It is a very ancient place. In 1044, Earl Leofric and his wife, Lady Godiva, founded here a magnificent Benedictine monastery. In memory of Godiva (q. v.), who is said to have ridden round the town naked, to free it from certain imposts laid on by her husband, curious and splendid processions are sometimes held in C. In the 15th c., religious mysteries or plays were often acted here by the Grey Friars before kings. Henry VIII. demolished the beautiful cathedral of C. Here occurred the famous meeting for the intended trial by battle between the Dukes of Norfolk and Hereford, immortalised in Shakspeare's *Richard II.* Two memorable parliaments were also held in the monastery of C. in the 15th century. The one contained no lawyers, while the other passed many attainders against the Duke of York, &c. In the 15th, 16th, and 17th centuries, C. was famous for woollens, broadcloths, caps, and blue thread bonnets. The Lammas Land lying around C., and comprising about 1100 acres, has been recently divided between the proprietors and the freemen, numbering (1862) 4195, in the proportion of about two-thirds to the former, and one-third to the latter. C. was visited by the plague six times between 1350 and 1625. The phrase, 'to send to Coventry,' took its rise most probably from the derivation of the name C., and meant 'to send to a convent;' i.e., to shut out from society.

**COVENTRY**, Sir John, has obtained a niche in English history from accidental circumstances. In the month of October 1670, he rose in parliament and asked a question relative to a measure before the House, which was taken as an unwarrantable reflection on the king's amours. Charles was furious, and sent some of his guards to watch in the streets where C. lived, and leave a mark upon him. C. was attacked one night, and had his nose cut to the bone. Parliament took notice of this atrocious outrage, and passed a bill known by the name of the Coventry Act, making cutting and maiming a capital offence; but they had not courage sufficient to bring the king's bravoes to trial.

**CO'VERDALE**, Miles, an eminent English divine, was born in Yorkshire in 1487. He was educated at Cambridge by the Augustin friars, and becoming an Augustin monk, was ordained at Norwich. He appears, however, to have soon changed his religious opinions, and to have devoted himself earnestly to the work of the Reformation. Being abroad in 1532, he assisted Tyndale with his translation of the Scriptures, and three years afterwards appeared his own translation of the Bible, with a dedication by himself to Henry VIII. This was the first English Bible sanctioned by royal authority, as, indeed, it was the first complete translation of the Bible printed in the English language. The Psalms of this translation are those still used in the Book of Common Prayer. In 1538, C., with the consent of King Henry VIII., and with the permission of Francis I., went to Paris to superintend another English edition of the Scriptures, his reason for going to Paris being that paper and workmanship were there cheaper and better than in England. The inquisition, however, notwithstanding the royal licence of Francis, interfered, seized the whole impression, consisting of 2500 copies, and condemned them to the flames. But through the cupidity of one of their executive officers, who sold a considerable number of the heretical books to a haberdasher as waste paper, some copies were saved and brought to London along with the presses, types, &c., which had been employed in printing them. Several of the workmen also came over to London; and Grafton and Whitchurch, the noted printers of that day, were thus enabled to bring out in 1539, under C.'s superintendence, the *Great Bible*, commonly called *Cranmer's Bible*, on account of that prelate having written a preface to it. In 1551, C. was appointed to the see of Exeter, the duties of which high ecclesiastical office he discharged with great zeal, until the accession of Mary in 1553, when he was ejected, and thrown into prison, from which he was only released after two years' confinement, on the earnest intercession of the king of Denmark, whose interest was evoked by his chaplain, C.'s brother-in-law, and on the condition that he should leave the country. C. went to Denmark, and subsequently to Geneva, where he assisted in producing the *Geneva Translation* of the Scriptures (1557—1560). On the accession of Elizabeth, he returned to England, but certain notions concerning ecclesiastical ceremonies imbibed at Geneva operated against his preferment in the church; and it was not until 1564 that he was collated to the rectory of St Magnus, London. Owing to age and infirmities, he resigned this living in 1566, and died in about two years afterwards. C. was the author of several tracts designed to promote the Reformation, and made various translations from the works of the continental reformers. The tri-centenary of the issue of his Bible was celebrated throughout the English Church, October 4, 1835, and medals were struck in honour of the occasion.

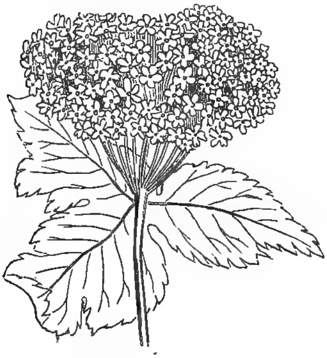
**CO'VERT WAY**, or **COVERED WAY**, in Fortification, is a road or broad path outside the ditch of a fortified place, between the counterscarp and the glacis. It is about 30 feet wide, and is sunk so far below the crest of the glacis, that soldiers standing upon it cannot be seen by the besiegers; hence the name of covert or hidden way. Sentinels, placed in the C. W., prevent all access of the enemy's spies to examine the ditch; and when musketeers mount on the banquette or raised platform on the side next the glacis, they can pour out a grazing fire on the enemy over the crest. The C. W. is broad enough to allow bodies of troops to form on it, either to act defensively or to make sorties; and to increase this accommodation, enlarged portions, called *places of arms*, are made at certain spots. In the annexed cut, representing a vertical section of the whole range of defence-works, from the *rampart* next the city to the *glacis*, the relation between the *C. W.* and the other works is clearly shewn. The *banquette* of the C. W. is here shewn to be about 3 feet high by 4 wide, and reached by a sloping ascent of 4 feet. A ground or horizontal plan of the C. W. is shewn in the wood-cut annexed to Curtain.



Vertical Section of Defence-works.

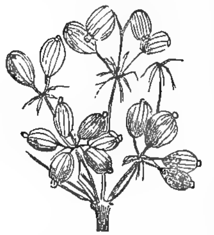
**COVILHÃ'**, a town of Portugal in the province of Beira, about 40 miles west of Coimbra, picturesquely situated among the mountains of Estrella. It has a population of 7000, chiefly engaged in the manufacture of a brown cloth, worn all over Portugal, called saragoca. There are some sulphureous baths in the neighbourhood, recommended for nervous diseases.

**COW.** See Ox, Dairy.



Cow Parsnip Flower.

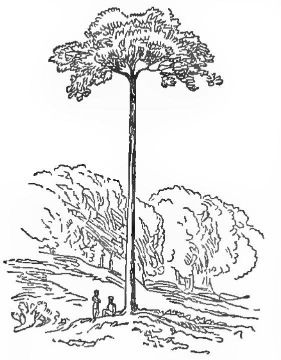
**COW PA'RSNIP** (*Heracleum*), a genus of plants of the natural order *Umbelliferæ*, having petals bent in at the middle, and flat compressed fruit. One species only is a native of Britain, the Common C. P. or Hog-weed, called *Kiesh* in Scotland; a common and rank weed, with coarsely hairy leaves, and stem about 3—5 feet high. It is gathered in some parts of England for fattening hogs, and is said to afford wholesome food for cattle. Some Siberian species are much larger, and have been recommended for cultivation on account of the great quantity of herbage which they yield very early in the season, particularly *H. panaces*, which sometimes attains a height of 10 feet, and the root leaves are 3—5 feet long.



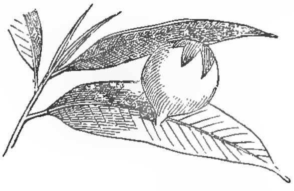
Cow Parsnip Fruit.

**COW PLANT** (*Gymnema lactiferum*), a perennial plant of the natural order *Asclepiadaceæ*, a native of Ceylon; with erect stem, ovate leaves, and very short umbels; which has acquired a factitious celebrity from the statement made and often repeated that its milky juice is used as a substitute for milk, and that its leaves are boiled to supply the want of cream! But this, according to Sir J. E. Tennant, is altogether a mistake, and the name is derived merely from the appearance of the juice.

**COW TREE**, a name given to a number of species of tree of different natural orders, the bland milky juice of which is used instead of milk. They are all natives of tropical countries, and mostly belong to natural orders in which acridity is the general characteristic of the milky juice. Some of them belong to the natural order *Moraceæ*, and are closely allied to the Fig; others to the natural order *Artocarpaceæ*, one of which is the famous Palo de Vaca or C. T. of the Cordilleras and Caraccas (*Galactodendron utile*, now rather referred to the genus *Brosimum*, see Bread-nut). Another is the Hya-hya (*Tabernæmontana utilis*), a native of equatorial America, belonging to the natural order *Apocynaceæ*.



Cow Tree (*Galactodendron utile*).



Fruit of Cow Tree.

The Palo de Vaca grows in rocky situations, at an elevation in equatorial regions of about 3000 feet. It is a lofty tree, with laurel-like leaves, 10—16 inches long, and very small flowers. For several months in the year, not a shower moistens its foliage, and its branches appear dead; but as soon as the trunk is pierced, there flows from it a copious stream of sweet and nourishing milk. The milk flows most freely at sunrise. The natives are then to be seen hastening from all quarters with bowls to receive it. The milk has an agreeable odour and a viscidity which does not belong to the milk of animals; it becomes yellow in a short time, and thickens or forms a sort of cream at the surface, which gradually thickens into a cheesy consistency before it begins to putrefy. This milk is nutritious, and is much used by the negroes and Indians; but differs very materially in its composition from the milk of animals; more than one half being wax and fibrin; a little sugar, a salt of magnesia, and water, chiefly making up the rest.

The Hya-hya also yields a copious milky juice, which is used in Demerara and elsewhere as a substitute for milk, and is very agreeable and nutritious.

**COW'AGE, COW'HAGE**, or **COW'ITCH**, consists of short, slender, brittle hairs, which grow on the outside of the pods of plants of the genus *Mucuna*, natives of the tropical parts of America and Asia. This genus belongs to the natural order *Leguminosæ*, suborder *Papilionaceæ*, and has a knotted, two-valved pod, divided by transverse partitions. The species are twining plants, shrubby or herbaceous, with leaves of three leaflets. That which yields most of the C. brought to Europe is *M. pruriens*, a native of the West Indies, with racemes of fine purple flowers, which have a disagreeable alliaceous smell, and pods about four inches long. *M. prurita* of the East Indies, and *M. urens*, the Ox-eye Bean of the West Indies, yield C. of similar quality. The hairs readily stick in the skin, and cause intolerable itching. C. is used in medicine, acting mechanically in killing and expelling worms, particularly the species of *Ascaris* (q. v.). That it does not act on the inner surface of the intestinal canal, is supposed to be owing to the mucous secretion. It is generally administered in syrup, treacle, or honey.—Before the pods of C. plants are ripe, they are used as a vegetable like kidney-beans, and are very palatable.

**COW'BANE.** See Hemlock.

**COW'BERRY.** See Whortleberry.

**COW'BRIDGE**, a municipal and parliamentary borough in the south of Glamorganshire, on the Ddaw, 12 miles west of Cardiff. It chiefly consists of one long and wide street. It once had walls with three gates, built in the end of the 11th century. One of the gates, a Gothic structure, still remains. Pop. 1066. With Cardiff and Llantrissant, it returns one member to parliament.

**COWES**, West, a seaport and watering-place in the north corner of the Isle of Wight, on the west side of the mouth of the estuary of the Medina (here a third of a mile broad). It stands on a hill slope, and has a striking aspect from the sea. There are many elegant villas in the vicinity. C. has much trade, being the port of the Isle of Wight. It has daily steam communication with Southampton, from which it lies 10½ miles to the south-south-east, and with Portsmouth, from which it lies 11 miles to the west-south-west. At the angle formed by the Medina and the sea, is a small battery built by Henry VIII. C. is the head-quarters of the Royal Yacht Squadron and Club, who hold their annual regatta here. Many ships are built. Pop. 4786. In 1859, 2052 vessels, of 66,065 tons, entered and cleared the port.—East Cowes is situated on the east side of the mouth of the Medina, and 2 miles north-west of Osborne House, the marine residence of Queen Victoria.

**COW'LEY**, Abraham, was born in London in 1618. He was the son of a grocer, and was educated at Westminster School and Trinity College, Cambridge. According to his own statement, he was made a poet by the perusal of Spenser, whose works were wont to lie in his mother's parlour. A volume of poems, entitled *Poetic Blossoms*, was published by him at the age of 15, and one of the pieces contained therein was written when he was 10 years old. At Cambridge he obtained distinction through the elegance of his translations; and while there, he composed the greater part of the *Davideis*, an epic in four books—a work which he never completed. He was attached to the court party, and, in consequence, was ejected from his college in 1643, after he had taken his degree of M.A. In 1646, he followed the queen to Paris, in which city he remained ten years; and on his return to England, being under suspicion, he was seized and bound in heavy securities for his future behaviour. In the same year, he published an edition of his poems, with a preface, in which certain passages appeared, supposed to have a political bearing, which were suppressed in subsequent editions. After the Restoration, he expected to obtain the mastership of the Savoy, but was disappointed. He subsequently obtained a lease of the queen's lands at Chertsey, in Surrey, whither he retired in 1665. He died in July 1667, in his 49th year, and was buried in Westminster Abbey, near Chaucer and Spenser. In 1675, a monument was erected to his memory by the Duke of Buckingham.

Although almost forgotten now, the time was when C.'s poetry was considered equal to Shakspeare's or Spenser's. It certainly possesses merits of ingenuity and verbal brilliancy. He is often splendid, but it is the splendour of the rocket rather than of the glowworm or the star. His prose is more natural than his verse, and some of its passages reach a stately eloquence, reminding the reader of the magnificent prose of Milton.

**COWLEY**, Henry Richard Wellesley, first Earl (his father being first Baron Cowley, better known as Sir Henry Wellesley), an English diplomatist of liberal opinions, was born in 1804. He early devoted himself to diplomatic pursuits. An attaché at Vienna in 1824, he was afterwards successively promoted to be secretary to the legation at Stuttgart, and to the embassy at Constantinople. Having acted as minister-plenipotentiary to Switzerland, and afterwards to Frankfurt, he was (1851) appointed minister to the Germanic Confederation, and in the following year he succeeded the Marquis of Normanby as ambassador at Paris. For this position he has displayed such eminent qualifications that he has ever since continued to hold the appointment, whether his party was in or out of office. Along with the Earl of Clarendon, he represented Great Britain at the Paris Congress of 1856; and it has been greatly owing to his tact and temper that the ill feeling that has occasionally oozed out since that time between the two countries has not resulted in more serious disagreement.

**COW-PEN BIRD** (*Molothrus pecoris*), also called Cow Bird, Cow Troopial, Cow Blackbird, Cow Bunting, &c., a bird nearly allied to the Baltimore Birds and Troopials, having a short, conical beak, and remarkable for its habit of depositing its eggs, like the cuckoo, in the nests of other birds. It is a native of North America, common in some of the southern states in winter, and migrating northward in spring. Great flocks are sometimes seen together. The C. B. is about seven inches in entire length, of glossy brownish black plumage. It derives its name from its frequenting cow-pens, to feed on the insects contained in, or attracted by the dung. It selects for the reception of its eggs the nests of birds smaller than itself, and by an interesting provision of nature, its egg, which is not much larger than theirs, is hatched sooner, and theirs appear to be generally removed as addled eggs.

**COW'PER**, William, an English poet, was born on the 26th November 1731, in the parsonage house of Great Berkhamstead. His father, who was chaplain to George II., married Ann, daughter of Roger Donne, Esq. of Ludham Hall, in Norfolk. This lady expired in childbirth in 1737, leaving two sons, William, the poet, and John. This event made a deep impression on C.'s mind; and the lines addressed to his mother's portrait have drawn more tears than any other poem in the English language.

C. was a delicate and sensitive child, and boyhood brought with it only deeper melancholy and depression. At the age of six he was placed at a considerable school, kept by a Dr Pitman, in Market Street, Hertfordshire. The period he spent here was very miserable, and laid the foundation of that settled gloom which oppressed him till death. It is to the remembrance of these wretched days that we are indebted for the fierce invective that burns in the somewhat one-sided *Tirocinium, or a Review of Schools.* C. completed his studies at Westminster School, and shortly after was articled to a Mr Chapman, an attorney in London.

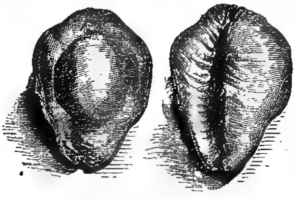
After completing his three years' articles with Mr Chapman, C. went, in 1752, to reside in the Middle Temple. In 1754 he was called to the bar, but never practised. His father died in 1756, and left him a small patrimony. In 1759 he removed to the Inner Temple; and although at this period he expected to secure some legal appointment through the influence of his family, he hated law with a perfect hatred, and seldom opened a book that bore on his profession. Yet he was industrious enough: he scribbled poetry, read Homer, and, in conjunction with his brother, translated some of the books of the *Henriade*. Soon after his settlement in the Inner Temple, he was appointed a Commissioner of Bankrupts; but there is no reason to believe that he ever entered on the duties of his office. An influential relative now offered him the office of Clerk of the Journals of the House of Lords, which was accepted; but he, having to undergo an examination at the bar of the House, was seized with nervousness, and could not appear. At this period his misery was so great, that he meditated suicide, but fortunately failed to carry out his intentions for want of courage. In December 1763 he was removed to the house of Dr Cotton at St Albans—a prey to the deepest remorse.

C.'s pecuniary means had suffered considerably by the loss of his appointments, but his friends contrived to make up an income sufficient for his wants. After his removal from St Albans, he went to reside in the town of Huntingdon. Here he formed acquaintance with Mrs Unwin, the Mary of his poems—an acquaintance which ripened into the deepest friendship, and which subsisted till death. He went to reside with the Unwins, and enjoyed much tranquil happiness under that religious roof. When on a visit, in January 1773, to the Rev. Mr Newton, a friend of the Unwins, and a man of sincere piety, but, from the peculiar cast of his religious views, perhaps not the best physician 'to minister to a mind diseased,' his malady returned. Mrs Unwin carefully tended him through the crisis of his delirium, and through his long and slow recovery. When convalescent, he betook himself to writing hymns along with Mr Newton, and to domesticating hares, with the particulars and little incidents of which amusement the world is pleasantly familiar. Mrs Unwin also suggested, as a subject suited to his genius, *The Progress of Error*. C. set to work in December 1780, and by the following March had completed *Truth*, *Table-Talk*, *The Progress of Error*, and *Expostulation*. Although the volume was completed in 1781, its publication was delayed till the following year.

In 1781, C. made the acquaintance of Lady Austen, who suggested to him *The Task*, urged him to translate *Homer*, and—what the world is perhaps still more grateful for—she related to him the history of John Gilpin. The story so seized C.'s fancy, that in the course of a single night he produced the poem which has tickled the midriffs of three generations. *The Task* was begun in the winter of 1783, and published in 1785. Its success was great, and C. began to be considered the greatest poet of his day. In 1784 he began the translation of Homer, which appeared in 1791. It was received with great applause. He had laboured hard, and had now to pay the penalty. The pen was the only weapon with which he could keep his constitutional malady at bay; but now, when seated at his desk, his genius would not answer the call. He began to hear again the voices and the whisperings which had afflicted him in earlier days. Mrs Unwin's faculties also became affected, and the two friends were groping in the same twilight, deepening for both into the darkness of death. They left Olney, and were received into the house of Mr Johnson, in Tuddenham, in Norfolk. Here Mrs Unwin died on the 17th December 1796. C. now fell into a state of utter dejection; in 1799 he was attacked by dropsy. He died on the 27th April 1800.

C. was a great innovator in English literature; he destroyed the sentimentalists led by Hayley, and the image-hunters headed by Darwin. His poetry is eminently healthy, natural, and unaffected. C. and Robert Burns we have to thank for bringing back nature to English poetry. Besides being a poet, C. was perhaps the most delightful letter-writer in the English language. Nothing can surpass the charm of his epistles—full of fun, gentle sarcasm, anecdote, acute remark, and a tender shadow of melancholy thrown over and toning down the whole. The best edition of C.'s works (accompanied by an admirable biography) is that of Southey, 15 vols. 12mo, Lond. 1837—1838.

**COW'RY** (*Cypræa*), a genus of gasteropodous molluscs of the order *Pectinibranchiata*—the type of a family, *Cypræidæ*, to all of which the name C. is often extended—having the margin of the mantle prolonged into a siphon, by which water is conveyed into the gill chamber, and a spiral convoluted shell, the spire visible in the young, but entirely concealed in the adult, and the outer lip then thickened and bent in. The aperture extends the whole length of the shell. The shells, called *Porcelain Shells* by the French and Germans, are almost entirely calcareous in their composition, are richly enamelled, and often very beautiful. They are most abundant, and attain their largest size in the seas of warm climates. Only a few very small species are found on the British coasts. Some of the species are much prized by collectors of shells. The Money C. (*C. moneta*) is of commercial interest, from its general use as a substitute for coin in many parts of Asia and Africa. It is not of great beauty, is yellow or white, often with a yellow ring, about an inch long, and nearly as broad as long. It is found on the Indian coasts, and in particular abundance on those of the Maldive Islands, and is one of their principal exports. In Bengal, 3200 cowries are reckoned equal to a rupee, so that a C. is about equal in value to one thirty-sixth of a farthing. Yet cowries to the value of 200,000 rupees are said to have been at one time imported annually into Bengal. Many tons of cowries are annually imported into Britain, to be used in trade with the west of Africa, and this importation began when it was in the slave-trade that they were employed.—To the family *Cypræidæ* belong the shells called *Poached Eggs* (*Ovulum*), the *Weaver's Shuttle Shell* (*Ovulum volva*), remarkable for its prolongation at both ends, &c. Fossils of this family are numerous in some strata, as in the *Bagshot Beds* (q. v.).



Money Cowry.

**COW'SLIP** (*Primula veris;* see PRIMROSE), a common native of pastures in England and many other parts of Europe, although rare in Scotland, a delicate and modest little flower, a universal favourite, both for its beauty and its fragrance. The flowers are small, in an umbel at the top of the scape, the limb of the corolla short and concave. The flowers have sedative properties, and are sometimes used as an anodyne and anti-spasmodic. They are fermented with sugar to make *cowslip wine*, an agreeable and favourite soporific domestic medicine.—The name VIRGINIAN COWSLIP is given to the *Dodecatheon Meadia*, a perennial plant, also of the natural order *Primulaceæ*, a native of North America, with a stalk about 8 inches high, bearing an umbel of gracefully pendent lilac flowers, the petals reflexed over the calyx, the stamens and pistil long, and the anthers of a golden colour. It is very ornamental in the flower-border, flowering in the end of April or beginning of May.

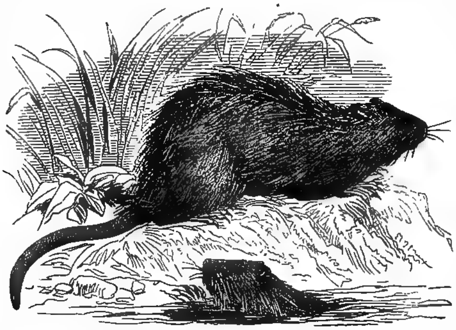
Cowslip.

**COW-WHEAT** (*Melampyrum*), a genus of plants of the natural order *Scrophulariaceæ*, having an oblong two-celled capsule, with a few seeds somewhat resembling grains of wheat. The species are natives of the temperate parts of the northern hemisphere, annual plants with opposite narrow leaves and yellow flowers, growing in woods, corn-fields, pastures, &c. Several are natives of England. They are said to be very fattening to cattle, and to give a yellow tinge and peculiar excellence to butter made from pastures in which they abound.

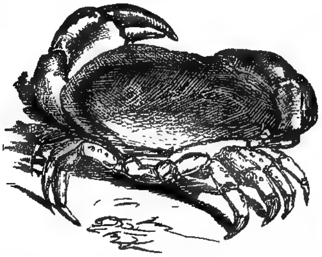
**COXE**, WILLIAM, a very industrious historical writer, was born in London, March 1747, and was educated at Cambridge. As tutor to the sons of several noblemen, he, at various times, spent many years on the continent, where he neglected no opportunity of collecting information about the countries which he visited. The result appeared in many volumes of travels and history, all of which are characterised by close observation, care, and research; but the writing in general is far from sprightly. Among the best known of C.'s works is his *History of the House of Austria*, which is still a standard work. C. also wrote *History of the Kings of Spain of the House of Bourbon*, *Memoirs of the Duke of Marlborough*, *Memoirs of Sir Robert Walpole*, and *Memoirs of the Pelham Administration*, besides many contributions to our knowledge of the topography and social condition of several continental countries. C., who commenced his clerical life in 1771 as a curate at Denham, near Uxbridge, ended it as Archdeacon of Wilts, which appointment he obtained in 1805. He died June 1828. Several of his works have been published in Bohn's *Standard Library*.

**COXI'M**, one of the head-waters of La Plata, rises in Matto Grosso, a frontier province of Brazil, towards Bolivia and Peru. After flowing first to the north-east, and then to the north-west, it enters the Taquari, itself a tributary of the Paraguay, in lat. 18° 24′ S. The C. receives many affluents.

**COY'PU** (*Myopotamus Coypu*), a rodent quadruped nearly allied to the beaver, with which it agrees in the number and character of its teeth, in its short limbs, in its feet having five toes each, the hinder feet webbed and the fore feet not webbed, and to a considerable extent in its habits; but from which it differs in the form of its skull, having a more elongated muzzle and a contracted palate, and in its slender tail resembling that of a mouse. It is the only known species of its genus, and inhabits great part of South America, on both sides of the Andes, burrowing in the banks of the rivers, and sometimes in forests near the sea-beach. It is very nearly equal in size to the beaver, has small ears, very long and stiff whiskers, and long hair mixed with dense and soft short hair, the upper parts beautifully pencilled with different shades of yellow, the sides and under parts lighter and more uniform in colour. The fur has become an important article of commerce, under the names of RACOONDA (q. v.) and NUTRIA, the latter name signifying in Spanish an otter, having apparently been given to it through mistake, but being that chiefly in use in Britain.


Coypu (*Myopotamus Coypu*).

**CRAB**, the popular name of all the crustaceans of the order *Decapoda* (the highest order of crustaceans, characterised by great concentration of the nervous system and corresponding general concentration, by five pair of thoracic limbs, and by having the gills enclosed in a special cavity on each side of the thorax, covered by the carapace) and sub-order *Brachyoura* (characterised by the small size of the abdomen, which resembles a short tail curved under the thorax and appressed to it, all the most important viscera being included in the thorax), and extended also to some of the sub-order *Anomoura* (Purse-crabs, Hermit-crabs, &c., characterised by a condition of abdomen intermediate between that of the *Brachyoura* and that of the *Macroura*, or Long-tailed Decapod Crustaceans, such as the Lobster, Cray-fish, &c.). All the crabs, besides many other crustaceans, were comprehended in the Linnæan genus *Cancer;* but the number of species is very great, and the *Brachyoura* alone are now arranged into many genera and even families. The different kinds of crabs differ very much in the form of the carapace (the back), which in some is orbicular or nearly so; in some, much broader than it is long; in others, longer than broad; in some, prolonged in front into a kind of beak, &c.; also in its smoothness, or roughness with hairs, tubercles, or spines; in the length of the legs, &c. The eyes are compound, with hexagonal facets, and are elevated on stalks, which are generally short, but sometimes considerably lengthened, and which have the power of motion, so as to turn the eye in different directions. The first pair of limbs are not used for locomotion, but exhibit in great perfection the characteristic claws or pincers (*chelæ*) of the decapod crustaceans. Crabs are inhabitants of almost all seas; most of them, however, having their limbs formed for walking rather than for swimming, are found chiefly near the coast; some inhabiting comparatively deep water, and others abounding in those parts which are left by the receding tide, where they occur equally in the rock pools and among the moist sea-weeds. Some small kinds of crabs (*Pea Crabs*) are often found in the inside of mussels and other bivalve molluscs. Some crabs inhabit fresh water, particularly in the warmer parts of the world; and others, known as Land-crabs (q. v.), live among moist herbage, or burrow in sand or earth. Some have the last pair of limbs expanded at the extremity into a broad blade for swimming, and some have even all the four pair of limbs intended for locomotion thus expanded, and sometimes occur far out at sea. Some of the crabs, with very long legs, are known as Spider-crabs. Crabs moult or change their shell, not at fixed intervals or seasons, but according to the exigencies of their growth; the change being made with great frequency when they are very young, but rarely in advanced age: indeed, from the molluscs, and other animals sometimes found adhering to the carapace, it is inferred that the same covering is sometimes worn for a number of years.—The metamorphosis of crabs is noticed in the article CRUSTACEANS.—Crabs are interesting inmates of the aquarium, from their readiness in seizing food, their activity in tearing and eating it, their general habits, and, in particular, their pugnacity. The


Large edible Crab (*Cancer Pagurus*).

number of specimens is apt, however, to be soon diminished by the stronger killing and eating the weaker.—Many kinds of crabs are used as articles of food in different parts of the world, as the Large Edible C. (*Cancer Pagurus*) and Small Edible C. (*Carcinus Mœnas*) of the British shores. The latter is extremely common on all parts of the coast, but is not nearly so much esteemed as the former, which is much sought after, and is caught either in the holes of the rocks at low tide, or by means of a kind of trap, a basket which readily permits its entrance but not its escape, and which is baited with meat or animal garbage of some kind. In winter it seems to retire to deeper water. Its black claws and very broad carapace, arched at the sides, readily distinguish it from all other British species. It is sometimes nearly a foot in breadth. The claws of the Edible C. were formerly ground to powder and used as a medicine, having, however, no properties but those of carbonate of lime.

**CRABBE**, GEORGE, a late English popular poet, was born at Aldborough, in Suffolk, on the 24th December 1754. His father was a warehouse keeper, and collector of the salt-duties at Aldborough, and exerted himself to secure for his son a superior education. C. early exhibited a passion for all kinds of book-learning, with a decided bias towards poetry. After being tolerably grounded at school in mathematics and classics, he was, in his 14th year, apprenticed to a surgeon at Wickham Brook, near Bury St Edmunds; but he had no liking for the profession, and ultimately proceeded to London, where he arrived in 1780, with £3 in his pocket, to make a trial of literature. For a while he was very unfortunate. At last, when threatened with arrest for debt, he resolved to make his case known to Burke. He told Mr Lockhart, years after, 'the night after I delivered the letter at the door, I was in such a state of agitation that I walked Westminster Bridge backwards and forwards until daylight.' The great orator at once appointed an interview, looked over C.'s poetical compositions, suggested several alterations which were adopted, and finally took *The Library* and *The Village* to Mr Dodsley, by whom the first-named poem was published in 1781. C. went to reside at Beaconsfield with his generous and brilliant acquaintance, and while there met Fox, Sir Joshua Reynolds, and Lord Thurlow; the last of these invited the new celebrity to breakfast, and presented him with a bank-note for £100 at parting.

By the advice of Burke, C. entered into holy orders, and was ordained curate of his native place in 1782. Shortly after, he was appointed domestic chaplain to the Duke of Rutland, and took up his residence at Belvoir Castle. *The Village* appeared in 1783, and established the reputation of its author. Shortly after, Lord Thurlow presented him with two small livings in Dorsetshire; and now, finding himself above all fear of want, he married Miss Sarah Elmy, and entered into the enjoyment of the purest domestic happiness. In 1785, he left the castle, and took up his residence in the parsonage of Strathern; thereafter for many years he botanised, studied geology, wrote poems, saw—in hurried visits to London—the distinguished men of his time, and was courted by them, enjoying an uninterrupted course of happiness and honour.

*The Newspaper* appeared in 1785; in 1807, C. published *The Parish Register;* in 1810, *The Borough;* two years after, he produced his *Tales in Verse;* and in 1819, he gave to the world his *Tales of the Hall.* In 1813 his wife died, and shortly after he procured the living of Trowbridge, where for the remainder of his life he resided. In the autumn of 1822, he came to Edinburgh, and was the guest of Sir Walter Scott. His health began to fail in 1828; he died on the 3d of February 1832, aged 78.

C. disdained all the luxuries of his art. He has no heroes with a Hyperion front, and no heroines radiant as Aurora. He worked with the delf, not with the porcelain of human clay. He concerns himself with wild smugglers, denizens of villages by the sea, full of ancient and fish-like smells; gypsies on the heath cooking the fowl purloined from the neighbouring barnyard, with tramps, vagabonds, and vagrants, and the inmates of the workhouse. On his page these unsavoury individuals live, carouse, curse, brawl, and die. He has pages stern as anything in *The Inferno;* many, droll as Hogarth's pictures; and one or two so sweet, and tender, and pathetic, that no man possessed of any sensibility can read them unmoved.

**CRABETH**, DIRK and WOUTER, the last surnamed the Elder, were two brothers, glass-painters, born (it is supposed) at Gouda in South Holland, and who flourished in the latter half of the 16th century. It seems Dirk visited France in his youth, whilst Wouter journeyed to Italy, where he studied the works of Raphael, as is evident from his productions. Wouter, it is said, surpassed his brother in drawing, grace, and clearness, while Dirk surpassed him again in colouring. They, however, were jealous of each other, and each concealed from the other the secrets of his processes. Their conjoint work in the church of St John at Gouda, is the masterpiece of the two brothers. Of the eleven painted windows in that church, seven are by Dirk, and four by Wouter. They were done between 1555 and 1571. Dirk died, it is believed, in 1601. It is unknown when Wouter died. The brothers were buried in the sanctuary they had so surpassingly illustrated.

**CRACKED HEELS.** From careless grooming, washing horses' legs and imperfectly drying them, permitting them to stand in accumulations of filth or exposed to draughts, the skin becomes inflamed, tender, itchy, thickened, and by and by cracked. An ichorous noisome discharge exudes, and lameness often results. In animals with round *gummy* legs, it is sometimes constitutional; underbred horses with rough hairy fetlocks present the majority of cases; white heels, being more delicate, are especially affected; whilst the hind limbs, exposed as they are to filth and cold, suffer most frequently. Cleanse carefully with tepid water; wash with a diluted solution of Goulard's Extract, or any other mild astringent; or dress occasionally with oxide of zinc ointment. Give, besides, a half-dose of physic, and a few mashes, carrots, swedes, or such laxative food, and where persistent, use diuretics (q. v.). When dry and irritable, poultice and apply glycerine before proceeding with astringents. In cold weather, and especially when the horse is heated, interdict washing the legs, except with tepid water, and enjoin careful drying.

**CRA'CKLIN**, a kind of chinaware, the glazing of which is purposely cracked in the kiln, as an ornament.

**CRACOVIENNE** (*krakowiak*), the national dance of the Polish peasantry around Cracow. It has a rather melancholy than lively melody in $\frac{2}{4}$ time, and is accompanied by singing. The pair who lead off the dance often begin with only the music of their own voices, and are soon followed by others, and the charm of the dance consists much in the diverting movements by which they seem to chase and avoid each other. The Poles have a multitude of little ditties of two lines each, adapted to this music and dance, which generally contain some allusion to natural phenomena, accompanied with some slight pleasantry.

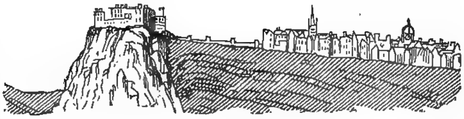
**CRA'COW** (Pol. *Krakov*), recently the capital of a small Polish republic, and more anciently the capital of the kingdom of Poland, is a city situated on the left bank of the Vistula, where it becomes a navigable river, in a beautiful plain surrounded by an amphitheatre of gentle hills. Lat. 50° 4′ N., long. 19° 52′ E. Pop. about 38,000, of whom 13,000 are Jews. It contains 46 churches, 15 monasteries, 10 nunneries, and 7 Jewish synagogues. The ancient city of C. is a labyrinth of narrow, dark, and deserted streets, but contains many fine specimens of Gothic architecture in its churches and other edifices; and some handsome buildings are also to be seen in the more modern suburbs. The old walls have been converted into a promenade. In the midst of the houses rises the castle, a huge building of an imposing appearance. The cathedral contains the tombs of many of the Polish kings, and of some of the greatest men of the Polish nation. The university was founded in 1364, by Casimir the Great, whose design was carried into effect by Jagello and Hedwig in 1401. It was long the centre of light for Poland, but decayed under the influences of the Jesuits, till it ceased to exist. It was reorganised and reopened in 1817, and underwent important changes in 1833. It possesses a museum of natural history, a botanic garden, a library of more than 30,000 volumes, and many MSS. of great value in connection with Polish history. C. suffered terribly from a fire in 1850. Its manufactures are trifling, and its trade, at one time very extensive, is now very limited, and in the hands of the Jews, but is said to be reviving. C. is connected by railway with Vienna, Berlin, and Warsaw. Three miles west of the city is a vast tumulus to the memory of Kosciusko. It is composed of earth taken from all the patriotic battle-fields of Poland.

C. was founded by Krak, Prince of Poland, from whom it derives its name, about the year 700, became the capital of Poland in 1320, and continued to be so till 1609, when that honour was transferred to Warsaw by Sigismund III. It was taken by the Bohemians in 1039, by the Mongols in 1241, by the Swedes in 1655 and 1702, and by the Russians in 1768. On the third partition of Poland, in 1795, it was assigned to Austria. From 1809 to 1815 it formed part of the Duchy of Warsaw. The congress of Vienna established it as a republic, with a small territory containing about 140,000 inhabitants, under the protectorate of Russia, Prussia, and Austria. The territory bordered with that of each of these great powers. Internal dissensions between the nobles and the common people afforded a pretence for interference, and the sympathy shewn by the inhabitants of C. for the cause of Polish independence in 1830 and following years was made the ground of proceedings, which terminated in 1846 in the annexation of C. to the Austrian dominions, a measure alleged to be necessary for the security of the neighbouring states, but against which Britain and France protested. C. now forms part of the Austrian crown-land of Galicia. An extensive line of fortifications is being constructed around it by the Austrians, with numerous detached forts, and one immense fortress on a height commanding the city, whose outworks will extend over a space of about five miles. These works are intended as a barrier against the advance of Russia.

**CRAFT** is a general designation for lighters, hoys, barges, &c., employed in loading or unloading large ships. In the royal navy, the name *small C.* is sometimes given to vessels commanded by lieutenants, such as cutters, schooners, gun-boats, &c. Also a term applied by seamen to any vessel whatever.

**CRAG**, a local term given specially to those masses of shelly sand which have been used from very ancient times in agriculture to fertilise soils deficient in calcareous matter. Geologists have used it to characterise several groups of strata. See CORALLINE CRAG, MAMMALIFEROUS CRAG, NORWICH CRAG, and RED CRAG.

**CRAIG AND TAIL**, a term used to designate a peculiar hill conformation, in which a bold and precipitous front exists on one aspect of a hill, while the opposite is formed of a sloping declivity. Those who first observed this form of the surface, believed it was the effect of currents of water moving in the direction indicated by the C. and T.; but latterly there have been speculations calling in the aid of ice, though not excluding the presence of water also. Fine examples of this structure occur in and around Edinburgh, where the western current has left the bold 'Craig' facing the west and the 'Tail' sloping towards the east; as, for example, the Castle rock, precipitous and unapproachable on every side except to the east, where it has protected the shale and sandstone beds from erosion.



Castle Rock, Edinburgh.

The direction and progress of the current can easily be traced; rushing against the hard basalt of the Castle rock, it was turned aside, and continued its course eastward, hollowing out the Nor' Loch on the one side and the Cowgate valley on the other, until the influence of the rock being lost, and aided by the resistance of the Calton Hill and Salisbury Craigs, the currents again met in the valley at Holyrood, when the 'tail' entirely disappears.

**CRAIG**, JOHN, an eminent preacher of the Reformation, was born in Scotland about 1512. Having spent some time as a tutor in England, he returned to Scotland and entered the Dominican order, of which he had not long been a member when he fell under the suspicion of heresy, and was cast into prison. On his release, he travelled on the continent; and after some time was, through Cardinal Pole's influence, intrusted with the education of the novices in connection with the Dominican order at Bologna. While here, Calvin's *Institutes* fell in his way, and converted him to Protestant doctrines. Having openly avowed the change in his opinions, he was brought before the Inquisition, and sentenced to be burnt—a fate from which he was saved by the mob, on the death of Pope Paul IV., breaking open the prisons in Rome, and setting the prisoners at liberty. C. escaped to Vienna, and obtained some favour at the court of Maximilian II.; but the news of his being there reached Rome, and the Pope demanded his surrender as one condemned for heresy. The emperor, however, instead of complying with the request of his holiness, gave C. a safe-conduct out of Germany. He now returned to Scotland, and was appointed the colleague of John Knox in the parish church of Edinburgh. Thinking the marriage of Queen Mary and Bothwell contrary to the word of God, he, while holding this position, boldly refused to proclaim the banns. In 1572, C. was sent 'to illuminate the dark places' in

Forfarshire and Aberdeenshire, and remained in the north until 1579, when he was appointed minister to King James VI. in Edinburgh. He now took a leading part in the affairs of the church, was the compiler of part of the Second Book of Discipline, and the writer of the National Covenant signed in 1580 by the king and his household. He was a man of great conscientiousness, and was not slow to oppose the proceedings of the court when he deemed them opposed to Scripture, and to speak wholesome but unpleasant truths to his majesty himself. He died December 1600.

**CRAIG, Thomas**, author of the well-known *Treatise on the Feudal Law*, was born probably about 1538. What part of Scotland he was born in is not known. Educated first at St Andrews, he afterwards prosecuted his studies at Paris, and passed as an advocate at the Scottish bar in February 1563, and in that or the following year was appointed justice-depute to Archibald Earl of Argyle, hereditary justice-general of Scotland. In literary pursuits, C. had distinguished himself above all his contemporaries, and while at the head of the criminal judicature of Scotland he did not neglect the *belles-lettres*, as was evidenced by an epithalamium on the queen's marriage with Darnley, and by a poem on the birth of James I. Besides his work on *Feudal Law*, C. wrote on the *Succession to the Throne of England*, in which he took a warm interest; a treatise on the union of Scotland and England, and one on *Homage*, vindicating Scotland from the charge of feudal dependence on England, which had been asserted by Hollinshed in his *Chronicles*; together with many poetical pieces. In the latter part of his life, C. acted as advocate for the Church of Scotland. He seems to have been high in favour with James VI., who wished to confer the honour of knighthood upon him; and when C. steadily refused, ordered that all persons should address him as if he really had accepted the honour. He died February 1608.

**CRAIGLEITH STONE**, a siliceous sandstone belonging to the carboniferous series, quarried at Craigleith, near Edinburgh, and largely used for building in that city, for which it is admirably adapted by its purity, durability, and the ease with which it can be wrought.

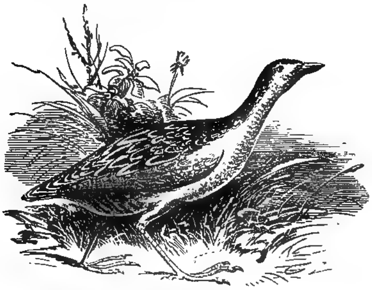
**CRAIK, George Lillie**, is by birth a Scotchman. Born in Fifeshire in 1799, he was educated for the church at St Andrews University, but, preferring a literary career, he went to London in 1824. His first work of importance was the *Pursuit of Knowledge under Difficulties* (1831), forming part of the series of publications issued by the Society for the Diffusion of Useful Knowledge. He also contributed largely to the *Penny Cyclopædia*. In 1839, C. became editor of the *Pictorial History of England*, some of the most valuable chapters of which were written by himself, and have since been enlarged and republished separately as independent works. Such are his *Sketches of the History of Literature and Learning in England from the Norman Conquest to the Present Time* (6 vols., 1844), and his *History of British Commerce from the Earliest Times* (3 vols., 1844). In 1849, C. was appointed to the chair of History and English Literature in Queen's College, Belfast, a situation which he still occupies. C. possesses an energetic and fruitful mind, his thinking is clear, his style accurate and pointed, and he is conscientious and careful in his statement of facts in no ordinary degree. Many of his slighter and more ephemeral works have contained suggestions in politics and social science which were both valuable and original, some of which were afterwards appropriated by, or ascribed to, others. In the first class we may mention the idea of mutual citizenship; and in the second, that of the representation of minorities, which unquestionably originated with him. Between 1849—1852 appeared his *Romance of the Peerage;* in 1855, his *Outlines of the History of the English Language*, which has passed through three editions; and in 1857, his essays on *The English of Shakspeare*, a second edition of which was published about two years since.

**CRAIL**, a royal and parliamentary burgh and seaport in the 'East Neuk' of Fifeshire, 2 miles south-west of Fifeness, and 10 miles south-east of St Andrews. Pop. 1247. Along with St Andrews, East and West Anstruther, Cupar, Kilrenny, and Pittenweem, it returns one member to parliament. C. was a town of some note in the middle ages, being then called Caryll. In 847 there was a skirmish with the Danes here, and at Fifeness there are still the traces of what is believed to have been a Danish encampment. There are traces of an old castle, in which David I. occasionally resided; of a priory college, and other adjuncts of an ecclesiastical establishment. The Established Church, though it has undergone many alterations, is still substantially the ancient structure, and the square tower, with the broach (q. v.) which springs from it, are in their original condition, and very perfect in form. It was after a sermon preached in this church by Knox in 1559, that his hearers rushed in an infuriated mob to St Andrews, and burnt the magnificent cathedral of the Episcopal metropolis. Archbishop Sharp was for some time minister of Crail. The harbour of C., though small, is safe; but there is a much more commodious site for a harbour in what is called Roome Bay, in the immediate neighbourhood, the desirableness of converting which into a harbour of refuge has often been urged on government. Could this improvement be effected, it is believed that C. would again become, as it was formerly, the great rendezvous for the herring-fishery. Even without this advantage, there has been a great revival in this branch of trade of late years, and fish is now cured to the value of £50,000 to £100,000 annually in the little fishing towns in this neighbourhood. Being a retired spot, with many traces of the well-being and good taste of earlier times still clinging to it, C. is eminently suited for a summer residence for sea-bathing purposes. Its bold coast offers pleasant rambles, and interesting excursions to the geologist

Crail Church (before the restoration).

and botanist. The town is lighted with gas, possesses good shops and markets, a reading-room, lecture institute, &c.

**CRAKE** (*Crex*), a genus of birds of the rail family (*Rallidæ*), differing from the true rails in having the bill shorter than the head and comparatively thick. The wings are also armed with a small concealed spine. The name is derived from the harsh call-note of the male. The best known species is the common CORN-CRAKE or LAND-RAIL (*C. pratensis*), the frequent call-note of which is heard from every field of corn or rye-grass in valleys and low grounds in the early part of summer, and is associated by almost every inhabitant of Britain with all that is pleasant in that pleasant season. The corn-crake is a very pretty bird, of a reddish-brown colour, marked with dark-brown in streaks along the middle of the feathers, lighter below; it has rather long legs and long toes; the tail is very short and pointed. It runs very swiftly, so as to be able sometimes to escape from a dog; but flies rather heavily, although it is a bird of passage, and is seen in Britain only in summer. It visits, in like manner, all the northern parts of Europe, and extends its migrations even to Iceland, spending the winter on the shores of the Mediterranean and in Africa. Its call-note may be so exactly imitated by passing the edge of the thumb-nail briskly along the points of the teeth of a small comb, that it can thus be decoyed within a short distance, although it is a very shy bird, and multitudes are familiar with its cry who never saw it in their lives. Its weight is ordinarily about six ounces. It is very highly esteemed for the table; and, according to Drayton, 'seldom comes but upon rich men's spits.' Two or three other species, very rare in Britain, but more common in the southern parts of Europe, are chiefly found in marshy grounds, and sometimes receive the name SORA (*Zapornia*). With them is ranked the CAROLINA RAIL or SORA RAIL (*C. Carolinus*) of North America, which spends its winters in the States near the Gulf of Mexico, but migrates northwards in summer, and is sometimes seen in vast numbers about marshes and the reedy margins of lakes and rivers, particularly in its migration southward in autumn. Its size is about equal to that of the corn-crake; and its colour is very similar, but with mingled short streaks of white. It is much esteemed for the table.



Corn-Crake (*Crex pratensis*).

**CRA'MBÉ**, a genus of plants of the natural order *Cruciferæ;* having a pouch (*silicle*) of two unequal joints, of which the upper is globose and one-seeded, the lower abortive. The cotyledons (q. v.) are conduplicate. The species, which are not very numerous, are scattered over the world. One is a native of Britain, *C. maritima*, the well-known SEA-KALE (q. v.). Another, *C. Tartarica*, with much divided leaves and a great fleshy root, a native of Hungary and other central parts of Europe and of Asia, is sometimes called Tartar Bread; and its root is eaten in the countries of which it is a native, either boiled, or more generally peeled and sliced with oil, vinegar, and salt.

**CRAMP**, an irregular, involuntary, and painful contraction of a voluntary muscle, without insensibility or other disturbance of the general system. C. is often the effect of cold, and has proved fatal to swimmers by attacking them suddenly when in the water. Otherwise it is a disease of little importance, and readily removed by warmth and friction, with regulated movement of the muscles affected. Cramps are a distressing symptom in cholera (q. v.), in which disease it has been proposed to treat them by applying a tight bandage or tourniquet (q. v.) to the affected limbs. See SPASM.

**CRAMP RINGS**, were rings which were supposed to cure cramp and the 'falling-sickness.' They are said to have originated as far back as the middle of the 11th c., in a ring presented by a pilgrim to Edward the Confessor, which, after that ruler's death, was preserved as a relic in Westminster Abbey, and was applied for the cure of epilepsy and cramp. Hence appears to have arisen the belief that rings blessed by English sovereigns were efficacious in such cases; and the custom of blessing for distribution large numbers of C. R. on Good Friday continued to exist down to the time of Queen Mary. The accomplished Lord Berners, ambassador to Spain in Henry VIII.'s time, writes from Saragossa to Cardinal Wolsey: 'If your grace remember me with some crampe ryngs ye shall doo a thing muche looked for; and I trust to bestow thaym well with Goddes grace.' The metal the rings were composed of was what formed the king's offering to the cross on Good Friday, usually either gold or silver. The superstitious belief in the curative property of C. R. made out of certain pieces of silver obtained in particular ways, still lingers in some of the less enlightened English counties.

**CRANACH**, LUCAS, a celebrated German painter, was born in the bishopric of Bamberg in the year 1472. Little is known of his early life, except that he was instructed in art by his father—that he visited Palestine in 1493 with the Elector Frederick the Wise of Saxony, who made him his court painter in 1504, at which period we find him in high reputation, especially noted for his facility. In 1508, the elector made him a grant of armorial bearings, having for crest a winged serpent. He made a journey into the Netherlands in 1509, and there drew a picture of Charles V.—the future emperor—then nine years old. C. seems to have acted as *factotum* at the court of the elector and his two successors, preparing for and directing the ceremonies and festivities, and knew besides how to follow other lucrative trades. In 1520 he bought an apothecary's business at Wittenberg, where he was also a bookseller and paper-maker, became councillor and chamberlain, and was twice chosen burgomaster of the town.

C. was closely bound up with the early reformers. He was the intimate friend of Luther, whose picture he several times painted. In 1550 he went to Augsburg to share the imprisonment of the elector, and returned with him to Saxony in 1552. C. died at Weimar, on the 16th October 1553, in the 81st year of his age, and was buried in the court church there. He had two sons, one of whom, Lucas, was known by the name of 'the younger Cranach,' an excellent colourist and portrait-painter.

C. has left behind him an unusually large number of authentic pictures—indeed, he painted beyond his powers. He excelled in portraits, in painting animals, in fabulous and droll pieces, and was an excellent colourist; but failed in form, grace, and unity, and in the higher walks of art. His last and greatest work is an altar-piece in the church of Weimar—a mystical representation of the crucifixion. His peculiar humour is best seen in such pictures as his 'Samson and Delilah' and his sylvan scene containing 'Apollo and Diana.'

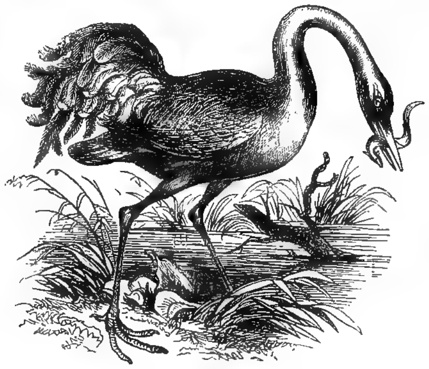
**CRA'NBERRY** (*Oxycoccus*), a genus of small evergreen shrubs of the natural order *Vaccineæ*, distinguished from the genus Vaccinium (see Whortleberry) by the wheel-shaped corolla, with segments rolled back and the filaments leaning to the pistil. The species are few, natives of the colder regions of the northern hemisphere. The fruit is acid, and is in great request for making tarts. The only British species is the Common C. (*O. palustris*, formerly *Vaccinium Oxycoccos*), a native also of the northern parts of Europe, Asia, and America. It grows in peaty bogs and marshy grounds, and is a small wiry shrub with creeping thread-like branches, and small oval leaves rolled back at the edges. The blossoms are small but beautiful, of a deep flesh colour. Large quantities of the fruit are collected in some places in the north of England, and in other countries, although the draining of bogs has now made it scarce where it was once plentiful. In Germany it is collected by means of a wooden comb, and preserved with sugar. In England, cranberries are often preserved in bottles closely corked or filled with pure water, in which they may be kept for a long time. They are an excellent addition to sea stores. Wine is made from them in Siberia, and a beverage made from them is sold in the streets of St Petersburg.—The American C. (*O. macrocarpa*) is a much larger and more upright plant, with leaves much larger and less rolled back at the margin. The berries are also larger and of a brighter red. It is a native of North America, frequent in Canada, and as far south as Virginia, growing in bogs, and particularly in elevated situations and where the soil is sandy. The berries are collected by means of a rake. Large quantities of them are exported to Europe. Cranberries are imported into Britain from Russia and other parts of the continent. Both kinds may be cultivated in gardens, in a peat-soil kept very moist or round the margin of a pond, and the produce of a small space properly managed is so great, that it is surprising that a C. plot should not be much more frequent.—The berries of the Red Whortleberry (*Vaccinium vitis idaea*) are sold under the name of cranberries in Aberdeen and other places, and are used in the same way.—A third species of C. (*O. erecta*, formerly *Vaccinium erythrocarpon*), a native of lofty mountains in Virginia and Carolina, is a shrub two feet high, and with a habit more like that of the whortleberries than of the other cranberries; it has a fruit remarkable for transparency and of exquisite flavour, and appears to deserve an attention and cultivation which it has not yet received.—The Tasmanian C. is the fruit of *Astroloma humifusum*, a little shrub with trailing stems, leaves somewhat resembling those of juniper, and beautiful scarlet blossoms, which is found in all parts of Van Diemen's Land. It belongs to the natural order *Epacridaceæ*. The fruit is of a green or whitish colour, sometimes slightly red, about the size of a black currant, and consists of a viscid apple-flavoured pulp, enclosing a large seed.—*Styphelia adscendens*, a small prostrate Australian shrub of the same natural order, has a fruit very similar to this; and in New South Wales the name C. is likewise given to the red acid berries of *Lissanthe sapida*, a low evergreen shrub, with small white flowers, also belonging to *Epacridaceæ*.

Cranberry (*Oxycoccus palustris*):
*a*, part of stem and branches, with roots, leaves, and flowers; *b*, a berry; *c*, transverse section of a berry.

**CRA'NBROOK**, a small town in the south of Kent, 30 miles south-west of Canterbury. It lies near the Crane, on an outlying ridge of the Hastings sand formation, and is the chief village of the Weald. Pop. 1652. It has a large hop business. It was once the centre of the clothing manufacture, introduced by the Flemings in the time of Edward III.; but this branch of industry has long since disappeared.

**CRANE**, a machine employed for the purpose of lifting weights. Cranes are of various kinds, but the most common consist of an upright revolving shaft, with a projecting arm or jib, having a fixed pulley at the extremity, over which is passed one end of the rope or chain to receive the weight, the other end being attached to a cylinder with wheel and pinion, by means of which the weight is raised to the required height. By the revolving motion of the upright portion, the load can be deposited on any spot within the sweep of the jib.

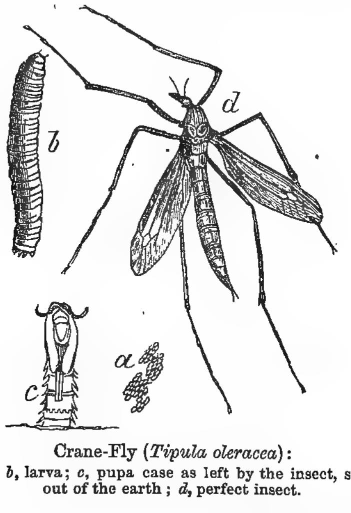
**CRANE** (*Grus*), a genus of birds of the order *Grallatores*, the type of the family *Gruidæ*. This family differs from herons, bitterns, storks, &c., in having the hind-toe placed higher on the leg than the front ones. It consists also of birds less addicted to marshy places, and which feed not only on animal, but, to a considerable extent, on vegetable food. They are all large birds, long legged, long necked,



Crane (*Grus cinerea*).

and of powerful wing, although their wings are rounded and not elongated; some of them performing great migrations, and flying at a prodigious height in the air. One of these is the Common C. (*G. cinerea*), which breeds in the northern parts of Europe and Asia, retiring in winter to tropical or sub-tropical regions. Flocks of cranes periodically pass over the southern and central countries of Europe, uttering their loud harsh cries in the air, and occasionally alighting to seek food in fields or marshes. The C., when standing, is about four feet in height; the prevailing colour is ash-gray, the face and throat nearly black, the wing primaries black. The tertial feathers of the wings are elongated, reaching beyond the ends of the primaries, and their webs are unconnected; they are varied and tipped with bluish-black, and are the well-known plumes once much used in ornamental head-dresses. The visits of the C. to Britain are now very rare, although in former times they were comparatively frequent. It feeds on roots, seeds, &c., as well as on worms, insects, reptiles, and even some of the smallest quadrupeds. It is much esteemed for the table.—There are several other species of Crane. The Whooping C. (*G. Americana*) is considerably larger than the common C., which it otherwise much resembles except in colour; its plumage, in its adult state, is pure white, the tips of the wings black. It spends the winter in the southern parts of North America. In summer it migrates far northwards, but rather in the interior than the eastern parts of the continent.—To the C. family belong also the Demoiselles (q. v.), with which, rather than with the true cranes, the Balearic Cranes or Balearicans are ranked.—Cranes use their bill as a dagger, and when wounded are dangerous to the eyes of a rash assailant.

**CRANE-FLY** (*Tipula*) a genus of dipterous (two-winged) insects of the family *Tipulidæ*, to the whole of which the name C. is often extended, nearly allied to the Gnat family (*Culicidæ*), which they resemble in their beautifully feathered and tufted antennæ, but from which they differ in having a comparatively short proboscis. The true crane-flies are also of comparatively large size. They have lanceolate spreading wings, and very long legs. One species (*T. oleracea*) is the well-known *Daddy* (or *Harry*, or *Peter*) *Long-legs*. This and other species abound in arable lands, gardens, meadows, &c., in summer; and their larvæ—remarkably tough worms without legs, sometimes confounded with wire-worms by farmers—are extremely destructive to crops of various kinds, devouring the roots of corn and pasture grasses, potatoes, turnips, and almost all the plants ordinarily cultivated either in field or garden. Rolling of fields is useful in killing them; and soot, salt, and other applications are employed in gardens.



Crane-Fly (*Tipula oleracea*):
*a*, eggs; *b*, larva; *c*, pupa case as left by the insect, sticking out of the earth; *d*, perfect insect.

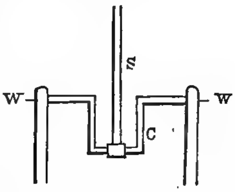
**CRANE'S-BILL.** See Geranium.

**CRANGANO'RE**, a maritime town of the district of Malabar on the west coast of Hindustan, stands at the mouth of a river of its own name, otherwise called the Aycotta. It is 19 miles to the north of Cochin, and 75 to the south of Calicut, being in lat. 10° 14′ N., and long. 76° 16′ E. At one time possessed by the Portuguese, it was taken from them by the Dutch about 1663; and after being purchased by the rajah of Travancore in 1789, and wrested from him by Tippoo Sultan in 1790, it was conceded by the latter to the British. But the more ancient history of the place is still more interesting, for here have existed from the 4th and 5th centuries respectively congregations of Jews and Christians.

**CRA'NGON.** See Shrimp.

**CRA'NIUM.** See Skull.

**CRANK**, in Machinery, is an arm or a bend on an axle or shaft, which may be driven by a connecting-rod or by the hand, its use being to convert an alternating straight motion into a continuous revolution. A crank may have part of the shaft on both sides, so that one rod, S, may drive two wheels, W, W, as in the fig. There are two positions in a C. in which the connecting-rod exercises no power whatever—viz., when the arm of the crank, C, is parallel to the connecting-rod, as in the fig., and again when the crank is at the opposite point of its course. A push or pull of the rod in such circumstances can only press the shaft against its bearings. The effect is greatest when the rod and the crank-arm are at right angles, and it decreases gradually on both sides of that position, until at the top and bottom it is reduced to nothing. In order to carry the C. over these *dead points*, as they are called, a fly-wheel is fixed on the shaft; this receives part of the force of the rod while at its best, acts as a reservoir, and by its stored-up momentum carries the shaft round when the rod is powerless.



**CRA'NMER**, Thomas, one of the chief reformers of the English Church, and the first Protestant Archbishop of Canterbury, was born at Aslacton, in the county of Nottingham, on the 2d of July 1489. He was descended from an old Norman family, which is said to have come into England with William the Conqueror. In his 14th year, he went to Jesus College, Cambridge, of which he was elected a fellow in 1510. He devoted himself diligently to the study of the learned languages, and also to the study of Scripture. His mind seems to have been early interested in the writings of Erasmus, Luther, and Le Fevre, and especially in their interpretations of Scripture. In his 23d year, he married, and so lost his fellowship; but his wife dying about a year after marriage, he was restored to it by his college. In 1523, he took his degree of D.D., and was appointed lecturer on theology. In 1528, during the prevalence of the sweating sickness in Cambridge, he retired with two pupils to Waltham Abbey: and Henry VIII., in company with Gardiner and Fox, afterwards Bishops of Winchester and Hereford, happening to be in the neighbourhood, the event proved a turning-point in the life of Cranmer. The king was then seriously concerned about his divorce from Catharine of Aragon, and in conversation on the subject with Gardiner and Fox, Cranmer suggested that the question should be 'tried according to the word of God.' Fox having mentioned this suggestion to the king, Henry was greatly pleased, and 'swore by the mother of God, that man hath the right sow by the ear.' From this time, Henry never lost sight of Cranmer. He was asked to reduce his suggestion to writing, and to have it submitted to the European universities. After this he was appointed Archdeacon of Taunton, and one of the royal chaplains. He was also sent to Rome on a special embassy about the divorce, but met with little success. Subsequently, he was despatched to the Emperor on the same errand, and while in Germany, he married a second time, a niece of the German divine, Osiander. This took place in 1532; and shortly afterwards, on the death of Archbishop Warham, he was recalled to fill the vacant see. Under his auspices, Henry's divorce was speedily carried through, and C. married the king to Anne Boleyn, on the 28th May 1533. In Anne's subsequent disgrace, and again, in the affair of Anne of Cleves, the archbishop took a part not very creditable to him. His position was no doubt a difficult one; but his character was naturally pliable and timid, rather than resolved and consistent. The same spirit characterises the measures of religious reform which were promoted by him. On the one hand, he joined actively with Henry in restricting the power of the pope, and in suppressing the monasteries; but, on the other hand, he was no less active in persecuting men like Frith, Forrest, and others, who, on matters of religious faith, were disposed to advance further than himself or the king. He did what he could, however, to resist the reactionary movement which took place in 1539, and which is known by the institution of the 'Six Articles.' He was also instrumental in promoting the translation and circulation of the Scriptures. On Henry VIII.'s death, Cranmer was appointed one of the regents of the kingdom, and along with Latimer and others, largely contributed to the advance of the Protestant cause during the reign of Edward. He assisted in the compilation of the Service-book and the Articles of Religion. The latter are said to have been chiefly composed by him. He was also the author of four of the Homilies.

On the accession of Mary, he was committed to the Tower, along with Latimer and Ridley. In March 1554, they were removed to Oxford, and confined there in the common prison, called the Bocardo. Latimer and Ridley bore their cruel fate with magnanimous courage; but the spirit and principles of C. temporarily gave way under the severity of his sufferings. He was induced, in the hope of saving his life, to sign no fewer than six recantations; but his enemies were determined to be satisfied by nothing short of his death. On the 21st March 1556, he suffered martyrdom, as his fellow-reformers had done, opposite Baliol College. His courage returned at the end, and he died protesting his repentance for his unworthy weakness in changing his faith, and shewing an unexpected fortitude in the midst of the flames.

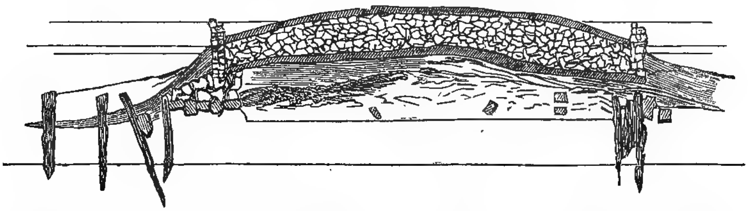
**CRANNOGES**, the name given in Ireland and in Scotland to the fortified islands in lakes which were in common use as dwelling-places and places of refuge among the Celtic inhabitants. The etymology of the word is uncertain, but it is believed to refer to the timber which was employed either in the fortification of the island, or in the construction of the houses which were placed upon it.

The earliest notice of such lake-dwellings which has been observed, is in the pages of Herodotus (book v. chap. 16). Writing of the Persian invasion of Thrace and Macedonia under Darius—about 500 years before the Christian era, and less than 100 years before his own death—he relates how the satrap Megabazus, warring against the Pæonians, led certain tribes of them captive into Asia, but failed to conquer those who inhabited Lake Prasias. 'He sought, indeed,' says the historian, 'to subdue the dwellers upon the lake, but could not effect his purpose. Their manner of living is the following. Platforms, supported upon tall piles, stand in the middle of the lake, which are approached from the land by a single narrow bridge. At the first, the piles which bear up the platforms were fixed in their places by the whole body of the citizens; but since that time the custom which has prevailed about fixing them is this: They are brought from a hill called Orbelus, and every man drives in three for each wife that he marries. Now, the men have all many wives apiece, and this is the way in which they live. Each has his own hut, wherein he dwells, upon one of the platforms, and each has also a trap-door giving access to the lake beneath; and their wont is to tie their baby-children by the foot with a string, to save them from rolling into the water. They feed their horses and their other beasts upon fish, which abound in the lake to such a degree, that a man has only to open his trap-door, and to let down a basket by a rope into the water, and then to wait a very short time, when he draws it up quite full of them. The fish are of two kinds, which they call the paprax and the tilon.' The Lake Prasias of the Father of History seems to be the modern Lake Takinos, on the Strymon or Kara-su, a river which, rising on the borders of Bulgaria, flows southward through Roumelia, and, after expanding its waters into a lake, falls into the Gulf of Contessa. The fish named by Herodotus have not been identified by naturalists; Lake Takinos abounds in carp, tench, and eels.

The island-dwellings of Lake Prasias met with comparatively little attention until archæologists, quite recently, found the remains of similar habitations in other parts of Europe. The first discovery was made in Ireland in 1839, by Mr W. R. Wilde, one of the secretaries of the Royal Irish Academy. The small lake of Lagore, near Dunshaughlin, in the county of Meath, having been drained, a circular mound, which had been an island in its waters, was observed to be thickly strewed with bones. As these were to be carted away for manure, it was found to be an artificial structure. Its circumference, measuring 520 feet, was formed by upright piles of oak about 7 feet long, mortised into oak-planks laid flat upon the marl and sand at the bottom of the lake. The upright piles were tied together by cross-beams, and the space which they enclosed was divided into compartments by oak-beams, some of which had grooves, so as to allow panels to be driven down between them. The compartments thus formed were filled with bones and black peaty earth. Portions of a second tier of upright piles were observed rising from the first tier. The bones were ascertained to be those of several varieties of oxen, of swine, deer, goats, sheep, dogs, foxes, horses, and asses. Along with them were found a vast number of weapons, ornaments, and utensils, fashioned of stone, bone, wood, bronze, and iron; such as swords, knives, spears, javelins, daggers, whetstones, querns (or hand-mills), beads, pins, brooches, combs, horse-trappings, shears, chains, axes, pots, and bowls. On reference to the ancient annals, in which Ireland is so rich, it was seen that, in 848 A.D., a hostile Irish chief 'plundered the island of Loch Gabhor [as Lagore was then written], and afterwards burned it, so that it was level with the ground;' and that again, in 933 A.D., 'the island of Loch Gabhor was pulled down' by the piratical Norsemen.

Mr Wilde's discovery at Lagore was followed by other discoveries of the same kind elsewhere in Ireland, so that in 1857 the existence of about fifty C. had been ascertained; and every succeeding year has seen an increase of the number. They shew several varieties of construction. The island at Lagore is a type of the purely artificial crannoge. But most frequently the crannoge was partly natural. An islet just level with the water, was raised artificially a foot or two above it. An islet too small to be a convenient habitation, or too easy of landing to be a place of defence, had its area artificially enlarged, or its banks artificially strengthened, generally by piles or stockades, but occasionally by heaps of stones. The space thus enclosed is generally a circle of from 60 to 80 feet in diameter; but in some cases the enclosed space is larger, and of an oval shape. The piles are generally of oak, mostly young trees, from four to nine inches broad, still bearing marks of the hatchet; usually a single row has been considered enough, but there are instances of two, and even of three rows. It would seem that originally the piles had risen several feet above the water, and it has been supposed that they were interlaced with branches placed horizontally, so as to form a screen or breastwork. The area within the stockade is sometimes wholly or partially covered with a layer of round logs, from four to six feet long, having stones, clay, or gravel above them. Fragments of oak-framing, with mortises and cheeks cut in them, have been found within the piles. In almost every instance, a few flat stones, apparently serving as a hearth, have been observed near the middle of the enclosure: in several C., two or three hearths have been met with. In some cases, a causeway leads from the island to the mainland; but in general the crannoge was to be reached only by boat, and scarcely any crannoge has been discovered without the remains of a primitive canoe, hollowed out of the trunk of an oak, being found beside it. In at least one crannoge, a pier or jetty projected from the island; it was a double row of piles and stretchers, running parallel to each other at a distance of about eight feet, and supporting a platform of logs. On almost every crannoge one or two querns (q. v.) have been found, along with bones of oxen, deer, goats, and swine, horns of cattle, deer, sheep, and goats, boars' tusks, and sharpening stones: fragments of pottery, and articles of stone, bone, horn, wood, glass, copper, bronze, brass, and iron, are of somewhat rarer occurrence. Many of the C. had been submerged by the gradual rise of the lakes in which they stood, so that their existence only became known as the great drainage-works of late years reduced the waters to their old level.

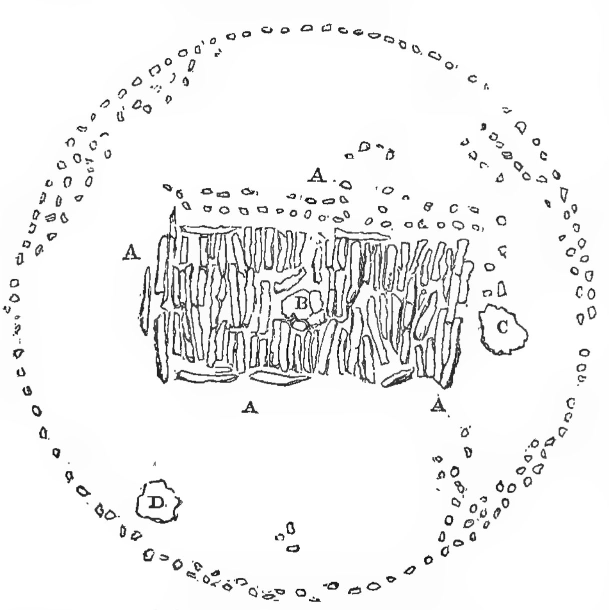
The accompanying woodcut shews a section (on the scale of 1 inch to 20 feet) of the crannoge in Ardakillin Lough, near Stokestown, in the county of Roscommon. The uppermost line marks the highest level of the waters of the lake; the middle line, the common winter level; the third line, the common summer level. The upper surface of the crannoge was formed of a layer of loose stones, surrounded by a wall, partly supported by piles. The stones rested on the natural clay, peat, and boulders of the island, in digging through which strata of ashes, bones, and logs of timber were met with. The stockades were of oak; the oblique or slanting stockade shewn in the woodcut represents a girdle of sheet-piling which quite encircled the crannoge.



The woodcut on the following page gives a ground-plan (on the scale of 1 inch to 20 feet) of one of two C. in Drumaleague Lough, in the county of Leitrim. The circle within the ring of stockades is 60 feet in diameter; in some places there are two, and in others, three rows of stockades; and within this outer ring, there are groups of piles, some of them arranged apparently for some special purpose. The oblong space in the middle, marked A, is covered by a rude platform of round logs, chiefly of alder, from four to six feet in length; it was probably the floor of the log-house, which was the chief or only dwelling-place on the islet. B shews where the hearth stood—a collection of stones, still retaining traces of fire; C marks a heap of stiff clay; D, the root of a large tree nearly buried in the peat, the surface of the wood being bevelled off with a hatchet, so as to form a sort of table, under which was found a heap of bones, apparently of deer and swine.

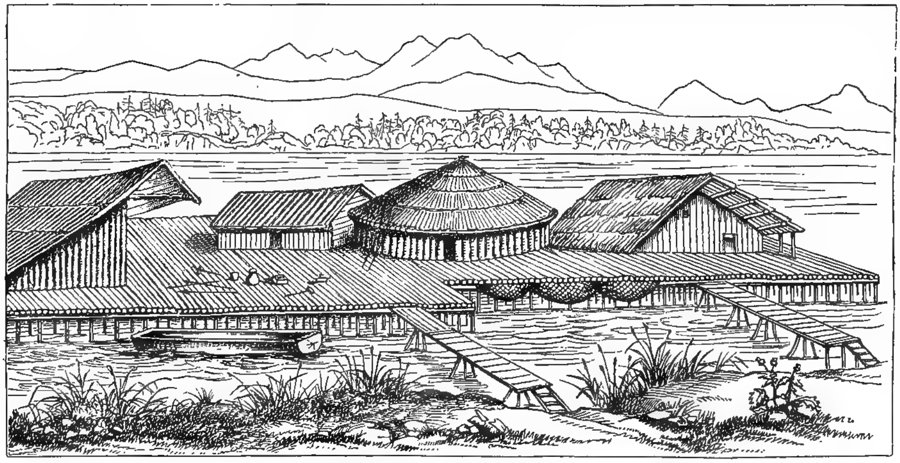
The Irish annals, it has been seen, make mention of C. as early as the 9th c., and they figure in history down to the middle of the 17th century. The crannoge of Lough Lynch, in Antrim, is shewn as the birthplace of Colkitto, a chief who figured in Montrose's wars, and has found a place in one of Milton's sonnets. The crannoge of Roughan Lake, near Dungannon, was the last retreat of Sir Phelim O'Neil in 1641. Two years later, there is record of an attempt to flood the crannoge of Loughinsholin, in the county of Londonderry, by turning a stream into the lake, and damming up its outlet. This attempt failed; but in 1645 the garrison were compelled by hunger to give the crannoge to the flames, and make their escape. In 1567, an agent of the English government, who was asked what were the castles of the O'Neil, wrote in reply: 'For castles, he trusteth no point thereunto for his safety, as appeareth by the razing of the strongest castles of all his countries; and that fortification that he only dependeth upon is in certain fresh-water lochs in his country, which from the sea there comes neither ship nor boat to approach them: it is thought that there, in the said fortified islands, lieth all his plate (which is much), and money, prisoners, and gages [i. e., hostages]; which islands have in wars heretofore been attempted, and now of late again by the lord-deputy there, Sir Harry Sydney, which for want of means for safe conduct upon the water hath not prevailed.'

While archæologists were still exploring the C. of Ireland, structures of a similar kind were discovered in the heart of the European continent. The winter of 1853—1854 was one of the driest that had been seen in Switzerland, and the lakes sank to a lower level than was ever known before.



Ground-plan of Crannoge in Drumaleague Lough.

The inhabitants of the village of Meilen, on the Lake of Zurich, took advantage of this unusual subsidence to reclaim a piece of land from the lake. As the work went on, a learned antiquary, Dr Ferdinand Keller, discovered the remains of rows of deeply driven piles, and, imbedded in the mud around them, found heaps of primitive weapons, tools, and utensils, made of stone and bone. Closer examination satisfied him that the piles had supported a platform; that on this platform huts had been raised; and that after being thus occupied, probably for centuries, the structure had been destroyed by fire. The discovery in the Lake of Zurich of these *Keltische pfahlbauten* (Celtic pile-buildings), as Dr Keller called them—*habitations lacustres* (lake-dwellings), as other Swiss archæologists have termed them—was followed almost immediately by the discovery of erections of the same kind in other lakes of Switzerland. No fewer than from 30 to 40 have been found in the upper and lower lakes of Constance; as many as 30 in the Lake of Geneva; more than 20 in the Lake of Neuchâtel; 10 in the Lake of Bienne; besides others in the deep peat-bogs which surround the hill of Chamblon, in the Vallée de l'Orbe, and in the lakes of Morat, Inkwyl near Soleure, Moosseedorf near Bern, Pfaffikon near Zurich, Wauwyl near Lucerne, and Nussbaumen in the canton of Thurgau. The site chosen for these lake-dwellings was generally a sunny and sheltered bay, with a gently shelving bottom of mud or clay. The piles, from four to ten inches in diameter, were rudely fashioned of whatever wood was at hand, oak, fir, ash, beech, birch, cherry, or apple. They were driven in a depth of not less than six or seven feet of water, at a distance of from 100 to 300 feet from the shore. They were ranged generally from one to two feet apart, in the form of a narrow parallelogram, having its longest side in a line with the edge of the lake.



Crannoge restored.

At Wangen, on the lower lake of Constance, the piles, from 30,000 to 40,000 in number, extend about 700 paces in length, and about 120 in breadth. At Morges, on the Lake of Geneva, the piles stretch 1200 feet in length, by 120 feet in width, so that they would have supported a platform with an area of about 18,000 feet, sufficiently capacious, according to the calculations of M. Frederic Troyon of Lausanne, to contain 316 huts, with a population of 1264 persons. The huts, it would seem, were for the most part circular in shape, measuring from 10 to 15 feet in diameter; they were of wattles, plastered with clay, masses of which hardened by fire, still bearing the marks of the wattles which it had received when wet and soft, have been recovered from the beds of the lakes.

In at least one instance, the remains of a bridge or gangway, leading from the platform to the shore, have been discovered. Many small boats, hollowed out of the trunks of trees, have been found; and one large vessel of the same kind, 50 feet long, and 3½ feet wide, has been observed at the bottom of the Lake of Bienne. The woodcut on the preceding page shews the *pfahlbauten*, as the Swiss archæologists believe them to have been in their original state.

The lake-dwellings of Switzerland have obviously much more resemblance to those of Lake Prasias, described by Herodotus, than to the C. of Ireland. But the Swiss at the same time can shew examples of the Irish type. At Nidau Steinberg, in the Lake of Bienne, there is an artificial mound of stones, resting on horizontal planks, and encircled by a row of upright piles. It is now submerged, but when—as the Swiss believe—the lake stood at a lower level, it must have been an island. At Moringen, in the same lake, there is another pile-building, enclosing a mound of stones which has an area of about half an acre. A canoe which had been used in its construction lies with its load of stones at the bottom of the lake. Structures still more nearly resembling the Irish C. have been found in the lakes of Inkwyl, Nussbaumen, and Wauwyl.

History and tradition are alike silent as to the pile-buildings of the Swiss lakes. That they belong to a remote age, will readily be granted, even by those who may hesitate to accept 'the stone, bronze, and iron periods' on which the Swiss antiquary rests their claims to 'pre-historic' antiquity; or who may question the grounds on which the Swiss naturalist assigns them to the 15th c. before the Christian era. Of the remains found in them, many appear to be those of a rude people—such as spear-points, arrow-heads, axes, chisels, knives, and even small saws, of flint and stone; arrow-heads, daggers, hammers, bodkins, needles, pins, rings, bracelets, necklaces, of bone or horn. Articles of bronze, some of them richly ornamented, are at the same time of common occurrence; and swords and other objects of iron are met with in considerable numbers. Some of the Swiss archæologists seem at one time to have thought that the piles surrounded by stone and bone implements shewed marks of greater age than the piles surrounded by bronze implements. It is now admitted, however, that both stone and bronze objects, and bronze and iron objects, are to be found in the same group of piles. It is to be remarked, too, that many of the objects of stone, bone, horn, bronze, and iron, are fashioned of the same shape, and for the same use, differing only in the substance of which they are made. Whoever the dwellers on the *pfahlbauten* were, their remains shew that they grew wheat and barley; that they ate the flesh of the ox, the goat, the sheep, and the pig; that among the beasts of the chase which they hunted down was the now extinct species of the aurochs (see BISON); that they had horses, dogs, and cats; that they had apples, pears, wild-plums, and wood-raspberries; that they baked pottery; that their women plied the distaff and knitted; that they made hempen mats; and that they wove linen cloths.

Hitherto, archæologists knew of lake-dwellings as existing only in Ireland and Switzerland; but in 1857, Mr Joseph Robertson read a paper to the Society of Scottish Antiquaries, proving that they were to be found in almost every province of Scotland. He not only ascertained the existence of about 50 examples, but was able to shew from records that they were known in Scotland by the same name of C. which they received in Ireland. The resemblance between the Scottish and Irish types seems, indeed, to be complete. Every variety of structure observed in the one country is to be found in the other, from the purely artificial island, framed of oak-beams, mortised together, to the natural island, artificially fortified or enlarged by girdles of oak-piles or ramparts of loose stones; from the island with a pier projecting from its side, to the island communicating with the mainland by a causeway. If there be any difference between the C. of the two countries, it is that the number of C. constructed altogether of stones is greater in Scotland than in Ireland—a difference which is readily explained by the difference in the physical circumstances of the two countries. Among the more remarkable of the Scotch C. is that in the loch of Forfar, which bears the name of St Margaret, the queen of King Malcolm Canmore, who died in 1097. It is chiefly natural, but has been strengthened by piles and stones, and the care taken to preserve this artificial barrier is attested by a record of the year 1508. Another crannoge—that of Lochindorb, in Moray—was visited by King Edward I. of England in 1303, about which time it was fortified by a castle of such mark that in 1336, King Edward III. of England led an army to its relief through the mountain-passes of Athol and Badenoch. A third crannoge—that of Loch Cannor or Kinord, in Aberdeenshire—appears in history in 1335, had King James IV. for its guest in 1506, and continued to be a place of strength until 1648, when the estates of parliament ordered its fortifications to be destroyed. It has an area of about an acre, and owes little or nothing to art beyond a rampart of stones and a row of piles. In the same lake there is another and much smaller crannoge, which is wholly artificial. Forty years after the dismantling of the crannoge of Loch Cannor, the crannoge of Lochan-Eilean, in Strathspey, is spoken of as 'useful to the country in time of troubles or wars, for the people put in their goods and children here, and it is easily defended.' Canoes hollowed out of the trunks of oaks have been found as well beside the Scotch, as beside the Irish crannoges. Bronze vessels, apparently for kitchen purposes, are also of frequent occurrence, but do not seem to be of a very ancient type. Deer's horns, boars' tusks, and the bones of domestic animals, have been discovered; and in one instance a stone hammer, and in another what seem to be pieces for some such game as draughts or backgammon, have been dug up.

Since 1857, the existence of lake-dwellings has been discovered in Savoy, in Upper Italy, in Hanover, in Prussia, and in Denmark. Less certain traces have been found in England, in draining a mere at Wretham Hall, near Thetford, in Norfolk. The savages of Borneo and New Guinea still live on the water, in huts perched upon platforms supported by piles; and wooden houses raised upon piles are common in Burmah and Siam, on the creeks and rivers of the Strait of Malacca, and it is believed elsewhere in Asia. A bas-relief from the palace of Sennacherib, engraved in Mr Layard's *Monuments of Nineveh*, represents what seem to be artificial islands, formed, it would seem, by wattling together the tall reeds of the marshes on the lower part of the Euphrates.

The C. of Ireland are described in the *Proceedings of the Royal Irish Academy*, vols. i., v., vii.; Mr Wilde's *Catalogue of the Museum of the Royal Irish Academy; The Archæological Journal*, vols. iii., vi.; Mr Digby Wyatt's *Observations on the Early Habitations of the Irish* (Lond. 1858); *The Ulster Journal of Archæology*, No. 26; *Proceedings of the Kilkenny Archæological Society*, No. 27. The chief works on the lake-dwellings of Switzerland are Dr Ferdinand Keller's three papers on *Pfahlbauten*, and Dr L. Rutimeyer's *Untersuchung der Thierreste* *aus den Pfahlbauten*, all published in the *Mittheilungen der Antiquarischen Gesellschaft in Zurich*, band ix., xii., xiii.; M. Frederic Troyon's *Habitations Lacustres de la Suisse* (Lausanne, 1857); his *Ossemens et Antiquités du Lac de Moossedorf*, in the *Bibliothèque Universelle de Genève*, for May 1857; his *Details of Discoveries at the Lake Habitations of Switzerland*, in the *Ulster Journal of Archæology*, No. 29; MM. Alb. Jahn and J. Uhlmann's *Die Pfahlbau-Alterthümer von Moossedorf* (Bern, 1857); and M. A. Morlot's *Etudes Géologico-Archéologiques en Danemark et en Suisse*, in the *Bulletin de la Société Vaudoise des Sciences Naturelles*, t. vi. (Lausanne, 1860). The Scottish C. are described in the *Proceedings of the Society of Antiquaries of Scotland*, vol. iii. On the subject of pile-buildings generally, reference may be made to Mr W. M. Wylie's paper *On Lake-dwellings of the Early Periods*, in the *Archæologia*, vol. xxxviii. (Lond. 1860), and to papers in the *Gentleman's Magazine* for December 1860 and February 1861.

**CRAPE**, a thin fabric made of raw silk, which has been tightly twisted, without removing the viscous matter with which it is covered when spun by the worm. It is simply woven as a thin gauze, then dressed with a thick solution of gum, which in drying causes the threads partially to untwist, and thus gives a wrinkled and rough appearance to the fabric. It is usually dyed black, and used for mourning apparel.

**CRAS-CROM**, an ancient and rude instrument of agriculture in the Highlands, consisting, as its name in Gaelic imports, of a crooked stick shod with iron, with a small projecting bar to rest the foot upon.

**CRA'SHAW**, RICHARD, an English poet, whose devotional strains exhibit imagination of a high order, with great copiousness and beauty of language, was the son of a clergyman in the English Church, and was born in London, at what date is unknown. He was educated at the Charter-house, and at Cambridge, where he obtained a fellowship in 1637. He entered the church about 1641, it is said, and became an earnest and eloquent preacher; but in 1644 he was ejected from his fellowship by the parliament, for refusing to take the Covenant. He went to France, adopted the Roman Catholic faith, and suffered great pecuniary distress, until, through Cowley's influence, he was introduced to Queen Henrietta Maria, who recommended him to certain dignitaries of the church in Italy. He soon obtained a secretaryship to one of the cardinals at Rome, and was made a canon of the church of Loretto. In this office he died about 1650. In 1634, C. published a volume of Latin poems, in which appeared the famous line, sometimes attributed to Dryden and others, relative to the miracle of the water being turned into wine.

'*Nympha pudica Deum vidit et erubuit.*'
'The modest water saw its God and blushed.'

In 1646 appeared his *Steps to the Temple*, *The Delights of the Muses*, and *Carmen Deo Nostro*, in which there is much fervid poetry. C. greatly resembles George Herbert in his cast of thought, and is not inferior to him in richness of fancy, though we find in him more exaggeration and conceit.

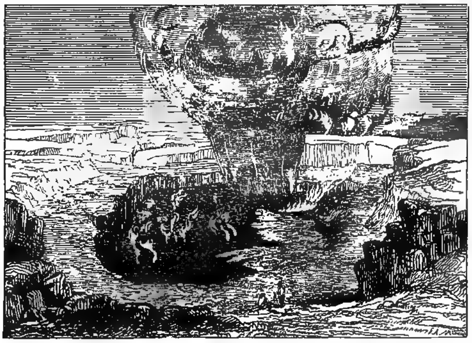
**CRASSULA'CEÆ**, a natural order of exogenous plants, some of them shrubby, and some herbaceous, all remarkable for their succulency. About 300 species are known, among which are house-leeks, stone-crops, rose-root, &c. They are widely distributed over the world, but South Africa particularly abounds in them. Most of them grow in dry places, and derive their nourishment from the air rather than from the soil, their roots seeming chiefly intended to fix them to the spot. Many of them are much cultivated in green-houses, more on account of their grotesque forms than for the beauty of their flowers. Some are refrigerant, and one or two are even used as food; others, on account of the tannin which they contain, are astringent; and some are acrid.

**CRA'SSUS**, the surname of several old Roman families, among which that of the Licinii was most remarkable.—CRASSUS (LUCIUS LICINIUS), born in 140 B. C., was the best orator of his age, and was as distinguished for his wit as for his rectitude in the capacity of proconsul. In 95 B. C. he was elected consul, along with Quintus Mucius Scævola (who had been his colleague in all his previous offices). During their consulship was enacted the *Lex Licinia Mucia de Civibus regundis*, banishing from Rome all who had not the full rights of citizens. This imbittered the feelings of foreigners toward Rome, and partly led to the Social War. As censor, C., in 92 B. C., closed all the schools of the rhetors—asserting that they had exercised a bad influence on the minds of young men. In consequence of the excitement attending a debate in the senate, C. died in 91 B. C.

**CRASSUS**, MARCUS LICINIUS, the triumvir, was born sometime before 115 B. C. His father and brother suffered death from the party of Marius, 81 B. C., and he himself—though young—was subjected to a jealous and dangerous surveillance. In 85 B. C., to escape from this, he went to Spain. He afterwards joined Sulla (83 B. C.), and distinguished himself in the battle against the Samnites at the gates of Rome. As prætor he crushed the Servile revolt, by the conquest of Spartacus at the battle of Lucania (71 B. C.), and in the following year was made consul with Pompey, a colleague whom he hated. On the other hand, Cæsar valued the friendship of C., the most wealthy of Roman citizens. During his consulate, C. gave a feast to the people, which was spread on 10,000 tables, and distributed a provision of corn for three months. Plutarch estimates the wealth of C. as more than 7000 talents, and Pliny states that the lands of C. were worth 8000 talents. About 60 B. C., Cæsar, Pompey, and C. entered into a private arrangement for their common benefit. This paction is known as the first *triumvirate*. See CÆSAR. In 57 B. C., as consul with Pompey, he gained the province of Syria, and professed to make preparations of war against the Parthians; but the acquisition of more wealth seems to have been his main object, and this he effected by plundering the towns and temples in Syria. At length, however, he set out, but was misguided by a treacherous Arab, and utterly defeated at the river Bilecha by the Parthians. C. now retreated to the town of Carrhæ, intending to pass into Armenia; but was beguiled into a conference with the Parthian general, Surenas, and was slain at the appointed place of meeting. His quæstor, Cassius, with 500 cavalry, escaped into Syria; but the remaining Romans were scattered and made prisoners, or put to death.

**CRATAE'GUS**, a genus of plants of the natural order *Rosaceæ*, sub-order *Pomeæ*, very nearly allied to *Mespilus* (Medlar) and *Pyrus* (Pear, Apple, &c.), but distinguished by the acute calycine segments, and by the round or oval fruit, closed at the apex, and concealing the upper end of the bony cells. The species are pretty numerous, natives of the temperate parts of the northern hemisphere, and in general have flowers in beautiful terminal corymbs. They are all large shrubs or small trees, more or less spiny, whence the name THORN has been very generally applied to them. The only native of Britain is the common Hawthorn (q. v.), (*C. oxyacantha*). Most of the species resemble it considerably in habit, size, form of leaf, &c. A number of them are now frequent in plantations and shrubberies in Britain, of which perhaps the most common is the Cock's-spur Thorn (*C. crus-galli*), a native of North America from Canada to Carolina. Its leaves are not lobed; its fruit rather larger than that of the hawthorn. The Aza'role (*C. Azarolus*), a native of the south of Europe, and the Aronia (*C. Aronia*), a native of the Levant, are occasionally cultivated for their fruit, which is about the size of the Siberian crab, and is used either for dessert or for pies. *C. Orientalis* (or *odoratissima*) and *C. tanacetifolia* have also fruit of considerable size. The latter is much eaten in Armenia. *C. Mexicana* has a large fruit, like a small apple, but not eatable. It is, however, very ornamental. The wood of most of the species much resembles that of the hawthorn. It is common to graft the rarer species on the hawthorn.—*C. pyracantha* differs much in appearance from most of the genus; being a pretty evergreen shrub, with lanceolate crenate leaves, and rich clusters of red berries, which remain on it all winter; a native of rocky places in the south of Europe and the Caucasus. It is often employed in Britain as an ornamental covering for walls, and is known as the Pyracantha.

**CRA'TER** (Gr. a cup), the central cup-shaped cavity in the summit of a volcano (q. v.), through which the lava, stones, scoria, &c., are for the most part ejected. These materials sometimes escape from immense rents in the sides of the volcano, as was the case in the famous eruption of Hecla in 1783, when two enormous streams of lava poured from its side to the distance, the one of 40, the other of 50 miles. Nor are the volcanic materials, when they escape through a crater, always ejected through the old vent on the summit; some other portion of the mountain may yield more readily to the pressure from within, and thus one or more lateral craters be formed, which, however, increase in height from the accumulation of ejected materials, and eventually, if the eruption continues, overtop the former cone.



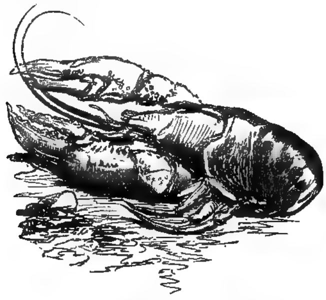
Crater of Kilauea in the island of Hawaii, Pacific Ocean: Depth about 1500 feet; circumference about 2 miles.

**CRATI'NUS**, a Greek comic poet, born about 519 B.C. Next to his younger contemporaries, Eupolis and Aristophanes, he is the most valuable representative of the Old Attic comedy. He changed its outward form considerably, and also sought to add to its vigour and power. Before his time, the number of actors had been indefinite; he limited them to three. He was the first to make comedy pungent and personal. The habits, manners, institutions—in fact, the whole public and private life of the Athenians—were considered by C. a legitimate mark for censorious satire. The greatest men did not escape. Pericles, for instance, was frequently and fiercely abused. C.'s style was very metaphorical and ingenious. Of his twenty-one comedies, nine of which obtained the first prize in the public competitions, we possess only some fragments. These have been collected by Meineke in his *Fragmenta Comicorum Græcorum* (Berlin, 1840).—There was also a younger Cratinus, a contemporary of Plato, who belonged to the school of the Middle Comedy.

**CRATI'PPUS**, a Peripatetic philosopher, was a native of Mitylene, and a contemporary of Cicero. He appears to have been held in the highest estimation by the great men of his age. Cicero calls him the prince of all the philosophers whom he had known. Pompey visited him after his defeat at Pharsalia, and received at his hands the consolations of philosophy; and Brutus went to Athens, to which city C. had latterly betaken himself, to listen to his prelections, even while making preparations to meet Octavius and Antony. Nothing that C. wrote has survived.

**CRAYER**, Caspar de, a Flemish historical and portrait painter, was born at Antwerp in 1582. He lived first at Brussels, and afterwards at Ghent, where he died in 1669. For the churches at Ghent he executed twenty-one altar-pieces. His works are to be found all through Flanders and Brabant. The galleries of Vienna and Munich also possess a few. Their main characteristics are vigour and boldness of design, and care and truthfulness in execution. Rubens was a great admirer of Crayer.

**CRAY'FISH**, or **CRAW'FISH** (*Astacus fluviatilis*), a crustacean of the order *Decapoda* (see Crab), sub-order *Macroura* (i. e., long-tailed—characterised by the elongation of the abdomen, and its termination in a sort of fin composed of five pieces and expanded laterally); nearly allied to the lobster, from which, however, it differs in having the middle plate of the tail-fin transversely divided by a suture. It inhabits the rivers and streams of many parts of Europe, and is common in some of those of England, making burrows in clayey banks, and coming forth at night in search of food, which consists chiefly of molluscs, small fishes, larvæ of aquatic insects, and animal substances of almost any kind. It is esteemed for the table, and is readily attracted by a bait of decaying flesh or animal garbage, which being enclosed in a net or in a bundle of twigs, numbers of C. may be captured at a time.—Other species of C. abound in some of the warmer parts of the world.



Crayfish (*Astacus fluviatilis*).

**CRAYON** (Fr. a pencil). Though used in French, and occasionally in English, to designate pencils generally, including those made of lead, the word C. is more frequently applied, in England, to those small cylinders of charcoal, or of pipe-clay or chalk coloured with various pigments, which are used for drawing. Cohesiveness is given to the paste of which the cylinders are formed by means of gum, wax, soap, &c. C. drawings are often remarkable for the delicacy and softness with which objects are represented, but they are deficient in power. See Pencil, Chalk.

**CREAM**, the butyraceous and richer portion of milk, which as lighter rises and settles on the surface. See Milk. The term C. is applied in a variety of ways, indicative of something superior in quality; as, *Cold Cream* (q. v.), and *Cream of the Valley*, a fine kind of English gin. The French, in referring to persons in the height of fashion, speak of *La crême de la crême*—The cream of cream.

**CREAM OF TARTAR** exists naturally in grape juice, but being insoluble in alcohol, it is gradually deposited, in the form of argol, as the sugar of the juice becomes converted into alcohol by fermentation. In the preparation of C. of T., the argol is dissolved in hot water, to which charcoal or fine clay is added, to take up the colouring matter; by boiling and filtering, a clear colourless solution is obtained, from which, on cooling, the C. of T. separates as crystals. Some of the crystals form at the bottom; others form a crust on the top, like cream, whence the name, cream of tartar. In chemical composition, it is the Bitartrate of Potash ($KO,HO,\bar{T}$), and contains potash, water, and tartaric acid. It is readily soluble in hot water, though it takes 60 parts of cold water to dissolve one part of the cream of tartar. It has an acid taste, and gritty feel. When taken repeatedly in small doses of a scruple to a drachm, it acts as a refrigerant and diuretic; in doses of one to two drachms, it is useful as an aperient; and in larger doses of from two to three drachms, it acts as a purging agent, accompanied by flatulence and griping. *Imperial liquid* is prepared by dissolving about a drachm of C. of T. in a pint of boiling water, and adding a little lemon-peel and sugar to flavour it; when an agreeable refrigerant drink is obtained, which is highly serviceable in allaying thirst in feverish cases. C. of T. whey is obtained by adding two drachms of the salt to a pint of milk.

**CRE'ASOTE**, or **KRE'ASOTE**, is an artificial organic substance, generally obtained from the products of the destructive distillation of wood. It is procured incidentally as one of the constituents of wood-tar, from which it is separated by a tedious process. The principal supplies are obtained from Stockholm, Archangel, and America. In the pure condition, C. is a colourless oily liquid, with high refractive powers; but the commercial specimens are generally coloured yellow or light brown. It boils at 398° F.; does not readily inflame; but when set fire to, burns with a smoky flame. It has a hot burning taste, and is very poisonous to plants and animals. It has a great power of coagulating albumen, and hence may be employed with advantage in toothache; a drop placed on the exposed nerve coagulates the albuminous tissue, and destroys its vitality and sense of pain. The most important property possessed by C., however, is its antiseptic or preserving power over vegetable and animal organs and structures. Thus, ordinary meat treated with only one-hundredth of its weight of C., and exposed to the air, does not putrefy, but becomes hard and dry, and assumes the taste and odour of smoked meat. Again, timber treated with C. does not suffer from dry-rot or other disease; and thus C., in a crude form, is employed in the preservation of wood (q. v.). The crude pyroligneous acid of commerce, which is often employed in the curing of hams, &c., owes part, at least, of its preserving powers to the presence of a trace of C., which leaves its characteristic odour so well known as obtained from the burning of wood for the smoking of hams, &c. When used medicinally, C. acts externally by destroying the cuticle; internally, in small doses of a drop or two, it is serviceable in arresting obstinate vomiting; whilst in large doses it produces nausea and severe vomiting, and, in many cases, fatal results.

**CRE'ATINE**, or **KRE'ATINE** (Gr. *kreas*, flesh), was discovered in 1835 by Chevreul, but little was known about it till Liebig published his *Researches on the Chemistry of Food*, in 1847. From his investigations, and those of subsequent chemists—amongst whom we may especially name the late Dr William Gregory of Edinburgh—the following facts regarding its properties and occurrence have been established.

C. forms transparent, glistening crystals, belonging to the clinorhombic system, and usually occurring in groups, the character of which is exactly similar to that of sugar of lead. Although usually grouped among the basic bodies, it is neutral in its reaction. It dissolves in 74·4 parts of cold water, and in boiling water in such quantity that the solution on cooling solidifies into a mass of delicate needles. These crystals contain two atoms of water and one atom of anhydrous C., whose composition, according to Liebig, is represented by the formula $C_8H_9N_3O_4$. There is no direct chemical test for the detection of C., and the methods which have been employed to obtain it are too complicated for insertion in this article.

C. is constantly present in the juice both of voluntary and involuntary muscles. The quantity differs in the flesh of different kinds of animals, and even in different muscles of the same animal, but is always very small; and lean animals yield relatively more than fat ones. According to Liebig, the flesh of hens yields the largest amount, viz., 0·32 per cent., the average quantity from horse or ox flesh being 0·07 per cent. Gregory determined its amount in the flesh of various mammals, birds, and fishes; and Schlossberger found 0·067 per cent. in human flesh. It has likewise been detected in very small quantity in the blood of oxen, also in the liquor amnii of women who have died in advanced pregnancy, and it can usually be obtained from the urine, although it is doubtful whether it is a normal constituent of that fluid. It does not exist in the liver or kidneys, but has been found among the soluble constituents of the brain.

Although the view has been advocated that, from its occurrence in flesh, and from its large amount of nitrogen (32·06 per cent.), it must be an important nutritive agent, there are most decisive reasons for opposing this opinion, and for ranking it among the products of excretion; for, in the first place, if it could be employed with further advantage in the organism, it (or its near ally, creatinine) would not be allowed to escape by the kidneys; secondly, the readiness with which it may be converted into unquestionable products of excretion (as, for instance, into urea, by the action of heat and baryta water), proves its approximation more nearly to these substances, than to such bodies as albumen or fibrin; and thirdly, there is no instance of a tissue-forming food occurring in a crystalline form.

**CRËA'TININE** is closely allied in its chemical and physiological relations to creatine. Liebig found that, when heated with a strong mineral acid, a solution of creatine no longer yields crystals of that substance, but a new body of totally different chemical properties, to which he gave the name of creatinine. Its chemical composition is represented by the formula $C_8H_9N_3O_2$, and on comparing this formula with that for creatine, we see that the conversion of the latter into the former, by the action of mineral acids, depends upon the separation of the elements of water. Liebig shortly afterwards detected C. as a constituent of the muscular juice. In the latter fluid, it occurs in less quantity than creatine; while in the urine, where it is also found, it is the more abundant of the two. Traces of it have also been found in the blood and in the liquor amnii.

C. crystallises in oblique rhombic prisms, is a most decided alkaloid, reacting strongly on vegetable colours, and having almost as caustic a taste as ammonia; it further differs from creatine in its far greater solubility in water, alcohol, and ether. There can be little doubt that C. takes its origin from creatine.

**CRÉBILLON**, Prosper Jolyot de, a French dramatist, was born at Dijon in 1674. He was sent to Paris to study law, but ended by devoting himself wholly to poetical pursuits. His first piece, *La Mort des Enfants de Brutus*, was rejected by the actors; but the succeeding dramas of *Idoménée* (1705) and *Atrée* (1707) were successful. *Rhadamiste* (1711), a tragedy of the dismal kind, was reckoned C.'s masterpiece, and established his reputation. After producing some other pieces, C. fell into pecuniary difficulties and neglect, and for more than twenty years produced nothing. His talents were then called again into requisition by Madame de Pompadour, who wished to humble Voltaire. He received from the king a pension of 1000 francs, and completed the tragedy of *Catilina*, for which the king himself supplied all the properties. When 81 years old, C. wrote his tragedy *The Triumvirate*, and, still later, commenced, but did not finish, another called *Cleomède*. He died June 17, 1762, and Louis XV. erected a monument to his memory. C., in general, displays little skill in the conduct of his plots; the monologues of the speakers are too numerous and too long; but in the opinion of his countrymen he is surpassed, in 'the grandeur of his sentiments,' only by the author of the *Cid* and *Horace*. The best edition of C.'s works is that published by Didot (2 vols., Paris 1818).

**CRÉBILLON**, Claude Prosper Jolyot de, the younger, son of the dramatist, was born in Paris, February 14, 1707. In an age of licentious manners, he acquired popularity by a series of romances, remarkable chiefly for their violation of decency; the principal of which are *Le Sopha, Le Hazard du Coin du Feu, Les Egarements du Cœur et de l'Esprit.* His own moral character is described as correct, but his writings undoubtedly served to extend the influence of the immoralities which he described. C. died in Paris, April 12, 1777.

**CRÉCY**, or **CRESSY**, a small town of France, in the department of Somme, situated on the Maye, about 12 miles north of Abbeville. C. is chiefly celebrated on account of the brilliant victory obtained here, 26th August 1346, by Edward III., with 40,000 English soldiers, over a French army amounting, according to Froissart, to 100,000 men, under the command of the Count of Alençon. In this great battle, one of the most honourable to English prowess recorded in history, the flower of French chivalry was slain, as well as the kings of Bohemia and Majorca, who were fighting on the side of France. Altogether, about 30,000 of the French army bit the dust. In this battle the Black Prince, who greatly distinguished himself, gained his spurs; and the crest of the slain Bohemian king, composed of three ostrich feathers, with the motto, *Ich Dien*, 'I serve,' was adopted by him in memory of the victory, and still continues to be borne by the Prince of Wales. C. is an ancient place, but its population now only amounts to 1300.

**CRE'DENCE**, a small table beside the altar or communion-table, on which the bread and wine are laid before being consecrated. In the Greek Church this is called the *Trapeza Prothesis.* Archbishop Laud was a great stickler for the C., and pleaded the authority of Bishop Andrews and other bishops for its use. There are credences in various Anglican churches; among others, in the Collegiate and St John's Churches, Manchester; and in the parish church at Ludlow, where they have been in use from time immemorial. Sometimes the place of the C. was supplied by a mere shelf across the fenestella (q. v.). The term was also used for a buffet, or sideboard, at which the meats were tasted in early times before being presented to the guests, as a precaution against poison. Hence the origin of the word, which is derived from the Ital. *credenzare*, to taste meats and drinks before they were offered to another, an ancient court practice, which was performed by the cup-bearers and carvers, who for this reason were called in Ger. *credenzer*. The getting up of credences or side-altars is one of those restitutions of old usages which has marked the Puseyite movement in England. See Pusey.

**CREDE'NTIALS**, papers or letters given to an ambassador, or other public minister, to a foreign court, in order to enable him to claim the confidence of the court to which he is sent.

**CRE'DIT**, in Political Economy, is one of many terms used in that science, of which it is said that we yet possess no scientific definition. This is the less to be regretted, as the practical meaning of the word is thoroughly known, so as to enable every one to understand what is meant, when economists speak of the extent to which C. is safe or proper, unsafe or improper, in this or that class of cases. We have come, perhaps, thus far towards an exact scientific notion of the nature of C., that while it serves the purpose of capital, it can only do so while there is capital ready to come and take its place if necessary. Credits which are not in this position—though they may happen to serve their turn, as a ship may sail some distance unwrecked without a steersman—do not accomplish the purpose of capital. The real power of C., properly resting on capital, is that it enables that capital to be devoted to more than one purpose. A bank is a great emporium of C.; that is to say, it consists of a certain amount of capital, which can be operated on by a whole community—not all at one time, but by individuals as occasion requires. Thus, a comparatively small stock of money can be made to do duty for carrying on numerous transactions. But it is indispensable for insuring a safe system of C. that money must be instantly available when wanted; and this principle applies not alone to banking, but to every species of transaction in which postponed payment is concerned. Unfortunately, this principle is too often set aside, and C. is grossly abused. The facts brought out in great bankruptcies generally teach the moral, that men who have every element of human wellbeing in their power, ruin themselves both in purse and fortune, by trying to make £30,000 do the work of £100,000. In many bankruptcies, too, there is a curious illustration of the power of C. as a representative of capital, in enabling men to keep up for a considerable time the appearance of being wealthy traders, though they never had a farthing they could honestly call their own. In the few instances where such projects succeed, there is the kind of applause which is given to the successful winner in any game of chance; and it is naturally felt that if the successful are applauded, it is hard to condemn the unsuccessful; so that there is perhaps a dangerous leniency in public opinion towards speculators on credit.

In a modified shape, C. is a thing which, to all appearance, can never be abolished. There is scarcely a human being in a civilised country, who does not transact a piece of credit business almost every day of his life. The workman hired by the week, and paid at its end, gives his employer C. from Monday morning to Saturday evening. The same workman, when getting a coat made for himself, even although he engaged to pay ready money on delivery, gets C. from the tailor during the making. It is necessary to consider these things, because a course of C. is often so hurtful to people of the working-classes, by fastening ruinous obligations on them, that some people have proposed to abolish all C. where they are concerned, by rendering them free from all legal procedure for the recovery of debts. The answer to this is, that although it is practicable to relieve any class from obligations, and their legal enforcement, it is impossible in a trading country to suppress debt and credit. It is practicable, however, so far to modify the legal remedies against debtors of the poorer class, that there may not be, as there too often is, a temptation to traders to transact a special business, in holding out temptations to working-people to purchase on credit.

**CREDIT,** Cash. See Cash Account.

**CREDIT,** Letter of. This is the term applied to accounts, usually in the form of a *letter*, addressed by one party to another, whereby the former requests the latter to pay a sum therein specified to the bearer of the letter, or some other third party named in it, and authorises him to reimburse himself for such payment, either by debiting it in account between the parties, or by drawing on the first party for the amount. This arrangement may take place between merchants or others, but in general it occurs between *bankers* residing in different places—as, for example, between a banker in Edinburgh and his correspondent in London; and it is designed for enabling a party who has money lodged at either place, to obtain the use of it at the other, without the risk or trouble of actually carrying it between the two cities. For this convenience a small charge is made by the bank issuing the letter, termed the exchange or commission. Sometimes the letter is addressed to *all* or *several* of the correspondents of the bank issuing it, in which case it is termed a *Circular Credit;* and any of them may pay the sum mentioned, or sums to account as desired, taking the holder's receipt, or his draft on the granter, in exchange; and the sums so paid being *indorsed* on the letter, to shew how far the credit has been used. If the party holding a circular letter can be properly introduced, even at a place where the granter has no correspondent, little difficulty will be experienced in obtaining money upon it, and the practice is to reimburse any one who has given the money, if within the amount of the credit. It will thus appear that the system is productive of much convenience to all parties who have occasion to travel, or transact business away from home, especially in foreign countries, where it might be difficult otherwise to make their way, except by carrying with them an unsafe amount of coin or other valuables.

Some bankers, having an extensive correspondence abroad, issue what are called *Circular Notes*, usually of the value of £10 or £20 each, which any of the granter's correspondents, or indeed any one else, may cash to the holder, on his 'indorsation;' but a third party must take his risk of its being questioned. For this kind of credit, the receiver at once reimburses the granter; whereas for the ordinary letter of C., he is only reimbursed when the drafts under it are advised to him, the holder continuing during the interval to raise interest on his money deposited for covering it. The circular-note plan was devised about 1770 by Mr Herries, the founder of the eminent London banking-house of Herries, Farquhar, and Company, who had originally been a continental merchant, and well knew the difficulties which travellers or traders then had to encounter in foreign countries. Although the system is now highly appreciated, it cost him no little trouble and perseverance to establish it in public estimation. See Circular Notes.

**CREDIT FONCIER,** a peculiar method of borrowing money in France on the security of landed property. It was established by an edict of 28th February 1852. Its peculiarity is, that the repayment of the loan is by an annuity terminable at a certain date; the date and the amount of annuity being so calculated, that when the last payment is made, the loan and the interest on it will be extinguished. Another method of describing it is as a loan repayable by instalments. The transaction is precisely regulated by the edict, which prohibits an advance on more than a half of the value of the property pledged or hypothecated. Three several companies have been established by the French government, with the privilege and function of making such advances.

**CRE'DITON,** or **KI'RKTON,** a borough in the middle of Devonshire, on the Creedy, a tributary of the Exe, 8 miles north-west of Exeter. It lies in a narrow vale between two steep hills. Pop. 3934. At C. was born the Anglo-Saxon Winfred, or St Boniface, who was the first to preach Christianity in Central Germany, founded the monastery of Fulda, and was Archbishop of Mentz. C. was the seat of a bishopric from 909 to 1050, when the sees of Devon and Cornwall were united and placed at Exeter. The chief manufactures were formerly woollens and serges, but now shoes. C. was much injured by fires in 1743 and 1769.

**CRE'DITOR.** See Debtor, Bankrupt.

**CRE'DO** (Lat. *I believe*), a part of the service of the mass, beginning with the words, *Credo in unum Deum.*

**CREEDS** and **CONFESSIONS** are the names given to the authorised expressions of the doctrine of the church at large, or of the several main sections into which it is divided. Such statements of doctrine sprang up naturally in the course of the church's progress. As the simple truths taught by Christ in an unreflective and mostly concrete form became the subjects of thought, of argument, of controversy, they could not fail to receive a more defined intellectual expression, and to be drawn out into more precise dogmatic statements. Men's minds could not be exercised on subjects of such vast importance to them without this result; and the great creeds, as they rise in succession before us, and mark the climax of successive controversial epochs in the church, are nothing else than the varying expressions of the *Christian consciousness and reason,* in their efforts more completely to realise, comprehend, and express the originally simple elements of truth as they are recorded in Scripture. The study of the creeds would be nothing else than the study of theology in its highest historical development—in its reflex settlements after the great agitations of Christian thought had run their course.

Corresponding to this view, we find that the creeds of Christendom grow in complexity, in elaborate analysis and inventiveness of doctrinal statement, as they succeed one another. The first are comparatively brief and simple in sense and form; the last are prolix and largely didactic. From the Apostles' Creed to the decrees of the Council of Trent, or the chapters of the Westminster Confession of Faith, there is a wide change, during which the Christian consciousness has grown from a childlike faith to a critical opinionativeness.

What has been called the *Apostles' Creed* is the earliest form of Christian creed that exists, unless we give the precedence to the baptismal formula at the close of St Matthew's Gospel, out of which many suppose the Apostles' Creed to have grown. There were in the early church differing forms of this primitive creed: that which is received and repeated in the service of the Church of England, has come to us through the Latin Church; and in several of its clauses, as, for instance, 'He descended into hell,' and again, 'The communion of saints,' is supposed to have been interpolated according to later notions. A great variety of opinions has been held as to the origin of this creed. The Roman Catholic Church has not only attributed it to the apostles directly, but professes to settle, on the authority of a spurious sermon of St Augustine, the clauses respectively contributed by the several apostles: 'Petrus dixit, Credo in Deum Patrem omnipotentem. Joannes dixit, Creatorem cœli et terræ. Jacobus dixit,' &c. The earliest account of its origin we have from Rufinus, a historical compiler and traditionalist of the 4th century. His statement is, that the apostles, when about to separate to preach the truth to different nations, agreed upon a 'form of sound words' which should express the sum of their common teaching. 'When met together, and filled with the Holy Ghost, they composed this compend of what they were to preach, each one contributing his share to the one composition; which they resolved to give as a rule of faith to those who should believe.' No great weight belongs to this testimony; Rufinus is no historical authority. It is not improbable in itself, however, that even in the age of the apostles some formula of belief existed. The exact form of the present creed cannot pretend to be so ancient by four hundred years, but a form not much different from it was in use long before. Irenæus, the scholar of Polycarp, the disciple of St John, when he repeats a creed not much unlike to the present, assures us that 'the church dispersed throughout the whole world had received this faith from the apostles and their disciples;' and Tertullian also affirms that a similar creed had been 'prevalent as a rule of faith in the church from the beginning of the gospel.' The same thing is proved by the creeds administered to the candidates for baptism in the 2d and 3d centuries. They correspond, with slight variations, to the Apostles' Creed. The true view of this formula of church belief, therefore, seems to be that which regards it as the Roman or Latin form of the creed which prevailed in all the early churches. It is not strictly apostolic—certainly not in the order of words derived through the Latin Church, in which it is now received and repeated; but it is substantially apostolic—fairly representative of the different elements of Christian faith as handed down from the apostles, and well claiming, therefore, the credence of the universal Christian church. Since the Reformation in England, it has been the usage to exhibit the Apostles' Creed and Ten Commandments in legible characters on boards near the communion-table in churches, in order that they might be seen and repeated by the common people, who were unprovided with books.

The *Nicene*, or rather, the Niceno-Constantinopolitan Creed, is the next great expression of doctrinal truth that we meet with in the history of the church. It sprang out of the conflict, which had begun even in the 2d c., as to the dignity and character of Christ. From the beginning, Ebionitism had looked upon Christ as merely a Jewish teacher of distinction; Theodotus and Artemon openly taught such a doctrine in Rome towards the close of the 2d century. Others, on the contrary, taught a doctrine which identified Christ with God absolutely in such a manner as to destroy all distinction of persons in the Godhead. Monarchianism, as it was called, which held rigorously and formally to the unity of God, was the ruling principle of both doctrines, opposite as were the expressions it assumed in the two cases.

The controversy thus begun in the 2d, perpetuated itself in the 3d c., under various modifications. Paul of Samosata carried out the Unitarian tendency, which reduced Christ to the level of a mere man; Sabellius carried out the same tendency in the opposite direction, which made Christ not merely divine, of the same substance with the Father, but looked upon him as merely a manifestation of the Father, without any distinct personality. Sabellianism recognised a Trinity of manifestations, but not a Trinity of essences. God was one and all-comprehending, and the Son and the Spirit were merely names or expressions for the different modes in which He reveals himself. Sabellius flourished about the middle of the 3d c., and Paul of Samosata somewhat later. Arius, who was a presbyter of Alexandria, grew up in the midst of these heretical influences, and soon distinguished himself in the Alexandrian church for his advocacy of the doctrine that Christ, although in a true sense divine, or the Son of God, was yet not the very God. He denied that he was 'of the substance of God,' or 'without beginning;' he was only the highest of created beings, in a sense divine, but not the same in substance with the Father, nor equal with him in power and glory. Athanasius came forward as the opponent of Arius, and the contest between them raged keen and wide throughout the church.

The Council of Nicæa was summoned in 325 by Constantine, with the view of settling this controversy; and the Nicene Creed was the result. There were these three parties in the council—the Athanasians, or extreme orthodox party; the Eusebians, or middle party; and the Arians, or heretical party. The heretics were few in number, and possessed but little influence; but the Eusebians were a strong party, and for some time resisted certain expressions of the orthodox or Athanasians, which seemed to them extreme and unwarranted; but at length the Homöousians, as they were called, carried the day; and Christ was declared not merely to be of like substance (*homoiousios*), but of the same substance (*homŏousios*) with the Father. At the later Council of Constantinople, the additional tenet of the divinity of the Spirit was added, and the creed completed in the form in which it is familiar to the English reader in the communion service in the Book of Common Prayer. In it we confess, as has been said, to the holy and undivided Trinity, and distinctly own the divinity of each person. We commemorate the creation of the world by 'God the Father Almighty;' we acknowledge Jesus Christ to be our 'Lord;' to have been 'begotten' from all eternity; to be 'of one substance with the Father,' and with him Creator of all things; that 'for our salvation he came down from heaven, was made man, and suffered and died for us.' We commemorate his resurrection, ascension, and sitting at God's right hand; express our expectation of his second coming; and declare that 'his kingdom shall have no end.' We confess to God that He hath appointed baptism for the remission of sins, and given us leave 'to look for the resurrection of the dead' and 'the life of the world to come.'

The next remarkable monument of doctrinal truth in the church is what is called the *Athanasian Creed*, a product of the 5th c., much later than Athanasius himself, but representing, with great formal minuteness and fidelity, his doctrine of the Trinity, as apprehended and elaborated by the Western Church. See ATHANASIAN CREED.

The Apostles', the Nicene, the Athanasian, may be said to form the great catholic creeds of the church. After the time of the last-mentioned formula, there is no general symbol of faith that claims our attention till the period of the Reformation. Theology continued to be cultivated during the middle ages, and especially during the 12th and 13th centuries, with great assiduity. Scholasticism is nothing else than the vast expression of the intellectual labour bestowed upon this subject during these ages, when scarcely any other subject can be said to have engaged men's minds. It was characteristic of scholasticism, however, to work mainly upon the doctrinal *data* already adopted and authorised by the church, developing these data in endless sentences and commentaries. There was, withal, no real freedom of inquiry, nor life of speculation. But as soon as the eye of free criticism and argument was turned upon Scripture with the Reformation, new Creeds and Confessions began to spring up. On the one hand, Protestantism had to defend its position and its scriptural authority by appeal to its system of belief; and, on the other hand, the Church of Rome, after many delays, gave forth at the Council of Trent (1545—1563), a more extended and detailed statement of its doctrine than was to be found in any previous creeds. The *Decrees of Trent* are the fixed authoritative symbol or confession of faith of the Church of Rome.

Of the Protestant churches, the most notable confessions of faith are the Lutheran; the continental Calvinistic or Reformed; the Anglican, or Thirty-nine Articles of the Church of England; and the Puritan, or Westminster Confession of Faith.

The Lutherans call their standard books of faith and discipline, *Libri Symbolici Ecclesiæ Evangelicæ;* and reckon among them, besides the three catholic creeds, the Augsburg Confession (q. v.), the Apology for that confession by Melancthon, the Articles of Smalkald drawn up by Luther, Luther's Catechisms; and in some churches, the Formula of Concord, or the Book of Torgau.

Of the continental Calvinistic or Reformed Churches, there are numerous confessions, the principal of which are—1. The Helvetic Confessions —that of Basel, 1530, and Bullinger, *Expositio Simplex*, 1566; 2. The Tetrapolitan Confession, 1531; 3. The Gallic Confession, 1559; 4. The Palatine or Heidelberg Confession, 1575; 5. The Belgic Confession, 1559.

The *Thirty-nine Articles* of the Church of England have been already described. See ARTICLES. They were originally forty-two, and are supposed to have been chiefly composed by Cranmer. In 1571, they were revised and approved by convocation and parliament.

The Westminster *Confession of Faith* was the product of the great Puritan agitation of the 17th century. As soon as the Long Parliament assembled in 1640, it set itself to consider the question of the reformation of religion. It carried resolution after resolution directed against the existing government of the Church of England; and at length, on the 23d of November 1641, it passed the famous Remonstrance, in which it proposed that, 'in order the better to effect the reformation in the church, there should be a general synod of grave, pious, learned, and judicious divines, who should consider all things necessary for the peace and good government of the church.' Out of this proposal sprang the Westminster Assembly, although the parliamentary ordinance actually summoning the Assembly was not issued till a year and a half later—viz., June 12, 1643. According to this ordinance, the Assembly was to consist of 121 clergymen, assisted by 10 lords and 20 commoners as lay assessors. Many of these appointed members, however, never took their seat in the Assembly. The bishops were prevented from doing so by a counter ordinance of the king.

Among the most notable divines who did assemble were Burgess, Calamy, Gataker, and Reynolds, and Gillespie, Henderson, Baillie, and Samuel Rutherford, the commissioners from Scotland, of the Presbyterian party; Goodwin, Nye, and Burroughs, of the Independent party; and Lightfoot and Coleman, with Selden, of the Erastians. The Presbyterians greatly predominated, and the acts of the Assembly bear throughout the stamp of Calvinistic Presbyterianism. It began its sittings in the autumn of 1643, and sat till the 22d February 1649, having lasted upwards of five years and a half. During this period it had met 1163 times.

The most important labours which it achieved were the Directory of Public Worship and the Confession of Faith. This latter document was completed in the third year of its existence (1646), and laid before parliament in the same year. It was approved by the General Assembly of the Church of Scotland in 1647, and again in 1690, on the renewed establishment of Presbyterianism after the Revolution.

The Confession of Faith, as it is the latest of the great Protestant creeds, so it is one of the most elaborate of them all. It extends to thirty-three chapters, beginning with *Holy Scripture*, and ending with *The Last Judgment.* Of its thirty-three chapters, twenty-one may be said to be distinctly doctrinal—the first nineteen and the last two. The others concern such subjects as *Christian Liberty*, *Religious Worship*, *Oaths and Vows*, the *Civil Magistrate*, the *Church*, the *Sacraments*, *Synods and Councils.* The tone of the doctrinal chapters is that of the later and formal Calvinism which spread from Holland among the English Puritans. The ecclesiastical spirit is Puritan-Presbyterian. 'God alone' is declared to be 'Lord of the conscience;' yet the 'publishing of opinions contrary to the light of nature, or to the known principles of Christianity,' is at the same time declared to be matter of censure by the church, and of punishment by the civil magistrate. In composition, the Confession is an able and comprehensive summary of theological truth, shewing great logical skill in the deduction of particular doctrines from certain main principles. The third chapter, *Of God's Eternal Decree*, may be said to be the key-note from which its most characteristic doctrines follow in immediate sequence and harmony. It is well deserving the attention of all students of theology, not only as a remarkable monument of Christian learning, but as the most representative expression of a great spiritual movement which has deeply tinged the national thought of Britain, and modified the course of its history.

It is issued, under authority, as a cheap duodecimo volume by printers in Edinburgh, for general use throughout Scotland. Incorporated in the volume is the text of the Covenants, but these are not esteemed part of the Confession. See COVENANTS.

**CREEK**, in Geography, is a small inlet on a low coast, and in rivers formed by the mouths of small streams. In America, the term C. is applied to small inland rivers.

**CREE'PER** (*Certhia*), a genus of birds, the type of the family *Certhiadæ;* having a longish, slender, arched, and pointed bill; a long, narrow, sharp-pointed tongue, jagged near its tip; the tail rather long, and the tips of the tail-feathers firm and pointed, extending beyond the webs. The feet are rather slender; the hinder toe about as long as the other toes. Of this conformation of feet and tail great use is made in climbing trees, the stiff feathers of the tail being employed for support. Although the family is large, it is doubtful if the genus contains more than one true species, the COMMON C. (*C. familiaris*), a bird found in all temperate parts of the northern hemisphere, wherever wood abounds. It is common in Britain, but is not so well known as many other birds, in consequence of its restless habits, its rapid movements, and prompt retirement to the opposite side of a tree or branch from a spectator. It searches for insects and their larvæ in the crevices of the bark, and generally ascends from the root to near the top of a tree before it flies off to another tree or branch. It generally builds its nest in a hole of a decayed tree. It is one of the smallest of British birds, although considerably larger than the wren. Its note is monotonous, and often repeated. Its prevalent colour is reddish-brown above, different shades being beautifully intermingled, and speckled with white; the under parts white. In Scotland, it is frequently called *Bark-speeler* (Anglicè, Bark-climber).—The WALL C. (*Tichodroma muraria*) of the south of Europe, frequents walls and the faces of rocks; it has a more slender bill, and the tail-feathers are not pointed.

Common Creeper (*Certhia familiaris*).

**CREEPS**, a miner's term for the depression which takes place on the surface from the removal of beds of coal beneath. Masses of the coal-seam, like huge pillars, are left by the miners for the support of the superincumbent strata; the pressure, however, of these beds is so great that, in course of time, the ceiling gradually sinks, or, as is more frequently the case, because of the ceiling consisting of hard rock, the softer shale pavement rises, until the intervening spaces between the pillars, left by the removal of the coal, are filled up. A consequent depression takes place in the beds above, as also an alteration of the surface-level. But this being so gradual is seldom noticed, except when it is made evident from the accumulation of surface-water, or in districts where railways pass over the coal-fields.

**CRE'FELD.** See KREFELD.

**CRE'MA**, a town of Lombardy, Northern Italy, situated in a fine plain on the right bank of the Serio, 25 miles east-south-east of Milan. C. is an ancient place, having been founded by the Longobards in the 6th century. It suffered much during the wars of the Guelphs and Ghibelines. C. is well built, is surrounded by a wall and ditch, has an old castle and cathedral, and manufactures of silk and lace. Pop. 8500.

**CREMO'NA**, a city of Lombardy, Northern Italy, situated on the north bank of the Po, which is here crossed by a bridge, about 48 miles south-east of Milan. It is surrounded by walls with flanking towers and wet ditches, its circumference being nearly 5 miles. A canal uniting the Oglio and the Po passes through the city; and the latter river is navigable for large boats from this point to the sea. The streets of C. are wide and regular, and it has some fine buildings—the principal of which are the cathedral, built at different times, exhibiting various styles of architecture; the churches of San Margherita, Sant' Agostino, Santa Agata, and San Giorgio; the Palazzo Publico, Campo Santo, and the Torazzo or belfry—one of the loftiest and finest towers in Italy, being 396 feet high, and commanding magnificent views over the fertile plains of Milan. By means of the Po, C. carries on a considerable trade in the produce of the district; and it has manufactures of silk, cotton, earthenware, and chemicals. It was formerly greatly celebrated for its manufacture of violins, the most famous maker being Amati, who flourished in the beginning of the 18th century. Its musical strings were also in great repute, but now neither violins nor strings have more than ordinary excellence. Pop. 37,000. C. is the capital of a province of the same name, which has an extent of about 500 square miles, and a pop. of 204,000.

**CRENE'LLE**, sometimes used for a battlement, but more frequently for the embrasures in a battlement. The adjective *Crenellated* is in frequent use to signify that a building is supplied with crenelles. See BATTLEMENT.

**CRENELLÉ**, in Heraldry, embattled, is used to signify that any ordinary is drawn like the battlements of a wall.

**CRE'NIC A'CID** is one of the constituents of vegetable mould, and is produced wherever leaves and other plant matter are decaying, especially in peat-bogs and marshes.

**CREÖ'LE** (Span. *criollo*) is a word used in speaking of the inhabitants of South America and the West Indies. In its widest sense, it designates any individual born in the country, but of a race not native to it. Thus, a negro born in the country is sometimes called a C., in opposition to one imported. It is usually applied, however, to persons born in the colony or country and of pure European blood, as distinguished from immigrant Europeans, and also from the offspring of mixed blood, such as mulattos and mestizos. Brazilian creoles call themselves also Brasileiros.

**CRESCE'NDO**, in Music, means a gradual increasing of sound, or changing from piano to forte and fortissimo. It is marked thus <, or with the abbreviation *cresc.* The swell of an organ, when well constructed, produces a most perfect crescendo.

CRE'SCENT. A representation of the half-moon with the horns turned upwards, called a C., is often used as an emblem of progress and success. It is generally spoken of as 'the arms' of the Turkish empire; but is more properly the emblem of the empire and people—not a very appropriate one in our day. It was, however, the emblem of the Greek before it became that of the Turkish rule; and at the present day, is frequently to be seen on churches in Moscow and elsewhere in Russia, generally surmounted with the cross, marking unquestionably the Byzantine origin of the Russian church.

CRESCENT, Turkish Order of. In 1799, after the battle of Aboukir, the Sultan Selim III. testified his gratitude to Nelson by sending him a C. richly adorned with diamonds. It was not intended as an order, but Nelson wore it on his coat, and on several occasions called himself the knight of the C. Selim was flattered by the value which the English admiral, already decorated with so many orders, seemed to attach to his gift; and it was this circumstance which determined him, in 1801, to found the Order of the Crescent. Mohammedans being forbidden in the Koran to carry such marks of distinction, the order is conferred only on Christians who have done service to the state. The second person on whom it was conferred was General Sebastiani, for his defence of Constantinople against the English fleet in 1807. The insurrection of the Janissaries suspended the efforts at Europeanising which Selim had begun, and when they were resumed by Mahmud, he instituted several other decorations. See Medjidie, Order of. There was an old order of the C., instituted at Angiers by René, Duke of Anjou, brother and heir of Louis III., king of Naples, in 1464. Its objects were those common to the religious military orders of those days, the honour of God, the defence of the church, the encouragement of noble actions, and the glory of the founder. The dukes of Anjou and kings of Sicily were sovereigns of the order. The badge was a C. of gold, on which was the word Loz, enamelled in red letters, the import being Loz (laus) en Croissant—Praise by Increasing. Like many other orders founded by the smaller sovereigns, the order of the C. did not survive the founder.

CRESCENT, in Heraldry, is used both as a bearing or charge, and as a difference, or mark of cadency. In the latter case, it designates the second son, and those that descend from him. See Cadency.

CRESCENT CITY, a rising town in the north-west of the state of California, stands on the right bank of the Tuolumne, about twenty miles above the entrance of that river into the San Joaquin, itself a tributary of the Sacramento, which falls into the noble harbour of San Francisco. The Tuolumne is navigable for steam-boats to a distance of 10 miles above Crescent City.

CRESCE'NTIA. See Calabash Tree.

CRESCENTI'NO, a town of Piedmont, in the province of Vercelli, about 22 miles north-east of Turin. It is situated in a marshy district near the confluence of the Dora Baltea with the Po. From its plan, it would appear to have been an old Roman station. It has manufactures of silk and woollens. Pop. about 5000.

CRESS, a name given to many plants, of which the foliage has a pungent, mustard-like taste, and is used as a salad. It is sometimes more strictly confined to the genus *Lepidium*, a genus of the natural order *Cruciferæ*, having small white flowers, and oblong or rounded laterally compressed pouches (silicules), with the cells one-seeded, and the valves keeled or winged on the back. The Common C., or Garden C. (*L. Sativum*), is an annual, a native of the East, frequently cultivated in our gardens, and used in a young state as a salad; being easily procured in a few weeks from the time of sowing, and, by the aid of a little artificial heat, even in winter. There is an esteemed variety with curled leaves. Like most of the other plants of similar pungent taste, particularly those of the order *Cruciferæ*, the garden C. is powerfully antiscorbutic. Still more pungent, and almost like pepper in taste, is its congener, Pepperwort, *Dittander*, or *Poor Man's Pepper* (*L. latifolium*), found in wet places near the sea in some parts of Britain, and occasionally used as a condiment by the poorer classes. It was once in high repute as a remedy for various diseases. Virginian C. (*L. Virginicum*) resembles the garden C. in its properties, and is eaten as a salad, and used as a diaphoretic medicine in North America and the West Indies. *L. piscidium*, a native of the South Sea Islands, is there used to stupefy fish; it is also one of the plants used by sailors for prevention or cure of scurvy. The name Winter C. is given to species of the genus *Barbarea*, also cruciferous biennial or perennial plants, with racemes of yellow flowers, quadrangular pods, and lyrate or pinnate leaves. The Common Winter C. (*B. vulgaris*), formerly known as Herb St Barbara, is plentiful in moist pastures and hedge-banks in Britain, and throughout Europe and North America. It is occasionally cultivated as a winter salad; in Sweden it is used as a boiled vegetable. Its pungency is combined with some degree of bitterness. A double variety is common in flower-borders, and bears the name of Yellow Rocket. Very similar to this, and also occasionally cultivated, is the Early Winter C., or American C. (*Barbarea præcox*), a native also of Britain, the continent of Europe, and North America. Bitter C. (*Cardamine*) is another cruciferous genus, with linear pods, and flowers sometimes of considerable beauty, as in the common Bitter C. or Cuckoo-flower (*C. pratensis*), also known by the name of Lady's Smock—a very common ornament of moist meadows

Cress (*Lepidium Sativum*): *a*, silicule.

Bitter Cress (*Cardamine amara*): *a*, silique, opening.

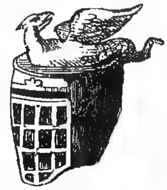
in Britain, with white, blush-coloured, or light purple flowers; the flowers of which are stimulant and diaphoretic, and had at one time a high reputation for the cure of epilepsy, particularly in children, and still retain a place in the pharmacopœias. The young leaves of this species, as well as of *C. amara*, a species with still more beautiful flowers, and *C. hirsuta*, a small flowered species, both British, are used as salads, but more generally in some continental countries than in Britain, being pungent with a little bitterness. The leaves of *C. amara* are brought to market in large quantities in Bohemia and Saxony. The juice of *C. pratensis* is much used as an anti-scorbutic in the north of Europe, to counteract the effect of the constant use of salted meat and salted fish. Water C. (*Nasturtium officinale*) is a perennial aquatic cruciferous plant, much used both in England and on the continent of Europe as a spring salad. The genus *Nasturtium*, which contains a considerable number of species, has a spreading calyx, and a nearly cylindrical pod. *N. officinale* is a native of almost all parts of the world. The leaves have a pungent bitterish taste, with a little saltness. They possess medicinal properties similar to those of Scurvy-Grass. In favourable weather, they may be procured in winter as well as in spring, and may be frequently cut over during a season. The plant is cultivated to a considerable extent both in Germany and near London, in wide ditches, which are filled with slowly flowing and pure water. It grows best in clear shallow running water, with a bottom of sand or gravel. Mud is injurious both to its growth and to the flavour of its leaves. For Indian-Cress, see Tropæolum.

Water-Cress (*Nasturtium officinale*).

**CRESSET** (Fr. *croisette*, diminutive of *croix*, cross), a name given to a great light on a beacon or watch-tower, to a lamp or torch, or a light fixed on a pole. The name owes its origin to the fact that formerly beacons were usually surmounted by a cross.

**CREST** (Lat. *crista*, a tuft, from *cresco*, to grow up). Though popularly regarded as the most important feature in heraldic emblems, the C., in the eyes of heralds, is an external adjunct to the shield, without which the bearing is complete, and which may consequently be altered without materially affecting its significance. Occupying the highest place on the helmet (see illustration), it is the member of the bearing by which the knight was commonly known in battle; and from this circumstance, it is to it that the term *cognizance* (from *cognosco*, to know) is properly given. Its claim to a classical origin is probably better than that of any other portion of coat armour. Jupiter Ammon is represented as having borne a ram's head on his helmet, and Mars the figure of a lion or a tiger. Alexander the Great, on the pretence that he was sprung from Jupiter, assumed the ram's head; and Julius Cæsar bore a star, to denote that he was descended from Venus. The helmet, as we see it represented on ancient statues and gems, was frequently adorned with a crest. Sometimes it was of horse-hair; at other times a lion or other animal was placed on the helmet, either erect or couchant.

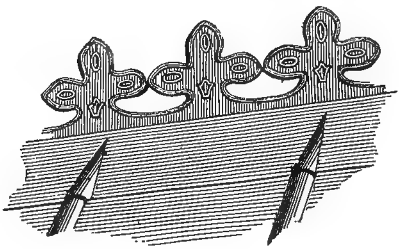
Newton, in his *Display of Heraldry*, says that the first C. to be met with in the monuments of English chivalry, is that on the great seal of Richard Cœur de Lion. The helmets in this instance, and in that of Roger de Quincy, Earl of Winchester, differ in form from those afterwards used, the C. occupying a much larger space. Crests are said to have come into general use about the time of Henry III., and to have been used as marks of distinction by commanders in the holy wars, as they had formerly been by the Roman centurions. For lightness they were often made of stuffed leather, which was gilt, silvered over, or painted—a circumstance which explains their greater size then than in later times, when they were made either of wood or metal. The earliest example of the wreath on which the C. is now invariably placed, is that on the monument of Sir John Harsick. It consisted of two pieces of silk, of the colours of the armorial bearings of the wearer, twisted together by the lady who had chosen him for her knight. Though crests are now invariable appendages to shields, and many of them are appropriated to particular families by hereditary descent, they are believed to have been originally assumed at the pleasure of the wearers; and they are even now less strictly under the cognizance of the heralds than the devices on the shield, which must always be assigned by competent authority. Crests are so various that a classification of them is scarcely possible. The following is an abridgment of that given by Newton, who has written very fully on the subject in his *Display of Heraldry*. The most ancient class of crests he believes to have consisted of ferocious animals, which were regarded as figuratively representing the bearer and his pursuits. Secondly, they were devices assumed as memorials of feats of chivalry, and for the purpose of perpetuating traditions and family legends, either in addition to, or differing from, those represented on the shield. Thirdly, they served only to give a more prominent place to objects already represented on the shield. Fourthly, they commemorated religious vows, or expressed the religious or knightly aspirations of the bearer. Fifthly, they were mere whims, and were adopted for no very definite reason, and served no very definite purpose. As many of them belonged to persons not only unconnected by family, but of different names, they no longer served the purpose of distinction when separated from the shield. To this latter class belong the vast majority of modern crests assumed at the suggestion of seal-engravers and coach-painters.



Helmet and Crest of Roger de Quincy, Earl of Winchester.

The lion assumed by Richard I., during the crusade in the Holy Land, to express the bravery for which he was proverbial, was borne by Edward III., Henry VII., Edward VI., and James I.; and since that time has been recognised as the appropriate C. of the royal family of England. In early times, the same C. was not always borne even by the same person. Besides the lion, Edward III. occasionally bore a white raven crowned; and other monarchs made use of similar additions. Anciently, the nobility mostly bore plumes of feathers. But several of the Earls of Warwick, of the Beauchamp family—the last of whom died in 1445—bore for C. a bear with a rugged staff, muzzled, collared, and chained, as it is still to be seen on signs (see woodcut). The origin of the wreath has been already mentioned. It is now represented as consisting of two stripes of gold or silver lace, twisted into a circular cord. Its tinctures are always those of the principal metal and colour of the arms. It is a rule in delineating the wreath, which is shewn edgewise above the shield, that the first coil shall be of metal, and the second of colour. Civic, triumphal, and other crowns were used as wreaths; and this practice is supposed to have given rise to the use of coronets, out of which crests are sometimes represented as issuing, even in the case of persons who are not noble.

**CRESTE**, in Architecture, an ornamental finishing, either carved in stone, or of tiles running along the top of a wall, or the ridge of a roof. *Crest-tiles*, or, as they are corruptly called, Cress-tiles, or Crease-tiles, are frequently in the form either of small battlements or Tudor flowers, as in the accompanying illustration from Exeter Cathedral. See Cops.



Crest-Tiles.

**CRESTED**, in Heraldry. When a cock or other bird has its comb of a different tincture from its body, it is said to be C. of such a tincture, naming the tincture.

**CRE'SWICK**, Thomas, R.A., one of the best and most popular of living English landscape-painters, was born at Sheffield, 1811. He early exhibited a taste for drawing, and in his 17th year removed to London, with a view to study the art as a profession. But already he had so far advanced, that two of his pictures were, during that year, admitted into the Royal Academy's exhibition. C. loves to paint the beautiful streams, and glens, and wooded dells of his native land; and these, which form the subject of his best paintings, are represented on his canvas with the very fidelity and freshness of nature itself. Among his greatest works are 'England,' 'London Road a Hundred Years Ago,' and the 'Weald of Kent.' His knowledge of aërial perspective is unsurpassed. C. has also painted some admirable sea-side studies. He was elected an associate of the Royal Academy in 1842, and R.A. in 1851. C. was one of the artists to whom the arrangement of the Gallery of Modern Paintings at the Manchester Exhibition of 1857 was intrusted.

**CRETA'CEOUS GROUP**, or **CHALK FORMATION**, the upper strata of the Secondary series, immediately below the Tertiary beds, and resting on the Oolite. This group is separated from the Eocene Tertiary beds by a decided change in both the rocks and fossils. The Eocene strata rest unconformably upon the chalk; it is, however, more than probable that a number of beds may yet be discovered to fill up the gap which apparently here exists in the sequence of the rocks.

The C. G. covers a large extent of surface in Europe and the east of Asia: beds of the period have also been noticed in North and South America. The typical strata occur in the south-east of England, and are connected with similar beds in the north of France and Germany, and in Denmark. Indeed, the bed of the German Ocean seems to be composed of rocks of this group, as is evidenced by the masses of chalk and flint thrown on the shores of Scotland after storms.

The strata of the group have been arranged in the following order. The maximum thickness of the divisions is given in feet.

| | | Feet. |
|---|---|---|
| Upper | 1. Maestricht, | 100 |
| | 2. Chalk with Flints, | 500 |
| | 3. Chalk without Flints, | 600 |
| | 4. Chalk Marl, | 100 |
| | 5. Upper Greensand, | 100 |
| Lower | 6. Gault, | 150 |
| | 7. Lower Greensand, | 850 |
| | 8. Wealden beds, | 1300 |

1. The Maestricht beds (q. v.) consist of pisolitic limestones in the north of France, and of loose yellowish sandstones in Holland. 2. The chalk with flints is a great mass of pure white pulverulent limestone, usually too soft for a building-stone, but sometimes passing into a more solid state. It occurs in beds of great thickness, with the stratification often obscure, except when rendered distinct by interstratified layers of flint a few inches in thickness, occasionally in continuous beds, but oftener in nodules, and recurring at intervals from two to four feet distant from each other. Iron pyrites is found frequently in these beds in radiated nodules; it readily decomposes, and produces rusty stains on the rock. 3. Chalk without flints; this differs from the upper chalk only in the want of flints. 4. Chalk Marl; the white chalk, by the gradual admixture of argillaceous matter, becomes hardened, until it passes into a pale buff-coloured marl or argillaceous limestone, sometimes of sufficient compactness to be used as a building-stone. 5. Upper Greensand (see Greensand), composed of alternating layers of sands, clays, and limestones, occasionally, but not always, coloured with green particles of a chloritic mineral. 6. Gault (q. v.), a stiff dark clay, used for brickmaking, with many beautifully preserved shells. 7. Lower Greensand (q. v.), so like petralogically to the Upper Greensand, that when the intervening Gault is absent, it is impossible to separate them, except by their organic contents. The Specton Clay, a local Yorkshire bed of dark clay, is of the same age. 8. Wealden (q. v.), divided into the two groups, the Wealden clay and Hastings sand, consists of a great series of shales and sandstones, with scattered beds of lime and ironstone.

The most remarkable petralogical characteristic of the group is the chalk, which exists in such abundance as to have given its name to the formation (Lat. *creta*, chalk). It is a white, soft, and pulverulent limestone, consisting almost entirely of carbonate of lime; the only foreign matter in any quantity being silex, which is aggregated together in an amorphous condition, in nodules or layers of flint. Occasional pebbles are also found, but they are extremely rare. Chalk was formerly supposed to be a chemical precipitate: the microscope has, however, shewn it to be composed of minute shells mixed with the broken fragments of larger ones; and, very recently, the use of an improved deep-sea sounding apparatus has revealed a sediment now accumulating in many places, which agrees in every point, save solidity, with the chalk. When a piece of white chalk is rubbed down to powder with water, by means of a soft brush, and the powder examined by the microscope, it will be found that the greater portion consists of shells of the minuter kinds of Foraminifera, mixed with the disintegrated prisms of Pinna or other large shells of like structure, the shells of Cytherina, a marine Entomostracan, and probably a few Diatoms. Deep-sea soundings have disclosed a formation precisely similar, as taking place at the present time. Of some gatherings obtained at a depth of two miles from the great Atlantic plateau, Professor Bailey says: 'I was greatly delighted to find that *all* these deep soundings are filled with microscopic shells; not a particle of sand or gravel exists in them. They are chiefly made up of perfect little calcareous shells (Foraminifera), and contain also a small number of siliceous shells (Diatomaceæ).' The occurrence of pebbles in the chalk can easily be accounted for, if we suppose them to have been floated in, attached to the roots of trees, or more probably to sea-weeds. It is more difficult to account for the origin of the flint. Professor Bailey found that some seas, especially in the Arctic regions, supplied an enormous quantity of the siliceous frustules of the Diatomaceæ, and spicules of sponges. That such organisms may have been converted into the flint nodules seems very probable, when we remember that many of the nodules have the external conformation of sponges, and shew occasionally also the internal structure. Mr Bowerbank's microscopic examination of flint nodules, seems to lead to the conclusion that all flints are produced from the siliceous skeletons of organic beings. Chalk, then, seems to have been a deposit in very deep seas, far out of the reach of land-currents, which would certainly have brought with them argillaceous and arenaceous debris.

The C. G. is highly fossiliferous. The remains of plants are abundant in the fresh-water Wealden beds; amongst them have been found fragmentary portions of dicotyledons. If we except the microscopic Diatomaceæ, which are not unfrequent in the white chalk, vegetable remains are rare in the other members of the group. The various divisions of the animal kingdom are represented in the organic remains of the chalk, if we except the warm-blooded vertebrata, which have hitherto—if they existed—escaped notice. Foraminifera were enormously abundant in the seas, and active in the secretion of the soluble carbonate of lime, fixing it in their minute shells, which, after their death, as has been shewn, formed the principal material of the chalk. In the lower beds, Polyzoa have been found in great abundance on the continent. Echinoderms are in immense numbers, and beautifully preserved. Crustacea are occasionally found. Of mollusca, the Brachiopoda and Cephalopoda are especially abundant, both being pelagic types. Ctenoid and Cycloid fishes appear in this group for the first time, though yet in small numbers—the Placoids and Ganoids being still the predominant forms. Reptiles, though not so numerous as in the former period, were yet far from rare. For further details of the fossils, see DIATOMACEÆ, SIPHONIA, VENTRICULITES, FORAMINIFERA, TEREBRATULA, RHYNCONELLA, HIPPURITES, SCAPHITES, AMMONITES, HAMITES, DIADEMA, PTYCHODUS, MOSOSAURUS, PLESIOSAURUS, ICHTHYOSAURUS, PTERODACTYLUS, &c.

**CRETE.** See CANDIA.

**CRE'TINISM,** from *crêtin* (French), an idiot of the Alps, and this again probably from *chrêtien*, a Christian, one who, from his state of fatuity, could not sin, and was viewed with some degree of religious respect. The name of C. is now applied in a more general sense to idiocy, or defective mental development depending upon local causes, and associated with bodily deformity or arrested growth. C. is very often found in connection with Goitre (q. v.), in the lower Alpine valleys, not only of Switzerland and Italy, but of the Pyrenees, Syria, India, and China. In Europe, it is rarely met with at a higher elevation than 3000 feet, and haunts chiefly the valleys surrounded by high and steep walls of rock, which exclude the light, and limit the free circulation of air. Cretins are always pitiable, and frequently repulsive objects; they are generally dirty, shameless, and obscene; their appetite is commonly voracious; the mouth is large and open, the tongue often protruded, the eyes small, the nose flat and broad, the skull narrow and small in all its dimensions, the forehead retreating, the complexion cadaverous; in addition to which, the whole body is dwarfish, the hands and feet large, the limbs often rickety, the belly protuberant. The cause of C. is still imperfectly understood; the recent researches of Virdrow tend to the conclusion that it is a physical degeneration, dependent on the reception of an undue amount of calcareous matter into the system; and this agrees with the general result of numerous observations previously made, as to the prevalence of goitre and C. in places where calcareous waters are alone accessible to the inhabitants. See GOITRE. Many attempts have been recently made to improve the condition of the cretin in childhood, by removing him from the locality of his birth, and by careful training; the institution founded by Dr Guggenbühl on the Abendberg (q. v.), near Interlaken in Switzerland, having been the prototype of many others on the continent, and of some in England and Scotland, for the education of Idiots (q. v.).

**CREUSE,** a river and a department in the centre of France. The river rises in the mountains on the southern border of the department of C., and flows in a generally north-north-west direction through that department, then in a north and westerly direction through Indre, and dividing the departments Vienne and Indre-Loire, falls into the Vienne, a tributary of the Loire, about 12 miles north of Chatellerault, after a course of about 150 miles.—The department to which the river gives its name lies in lat. 45° 39′—46° 26′ N., and long. 1° 24′—2° 36′ E. On an area of about 2200 square miles, it had a population, in 1856, of 278,889; a considerable decrease, as compared with 1851. Low mountains and chains of hills occupy the greater part of the land. The streams, with the exception of the C., are insignificant. The climate is moist and variable, and the soil thin and light in the southern hilly district, which is interspersed with stretches of heath and pasture, but better in the lowlands of the north-east. The products are rye, buckwheat, oats, and potatoes; but agriculture is backward, and the rearing of cattle forms the chief branch of rural industry. Large quantities of chestnuts and fruit are grown. The minerals are not important. The people of C. are but slightly educated, and use a coarse patois; but are generally industrious, and annually migrate in large numbers to find work in various parts of France. C. is divided into the arrondissements Aubusson, Bourganeuf, Boussac, Guêret, with Guêret for its capital.

**CREUZER,** GEORG FRIEDRICH, a learned German philologer, was born at Marburg, March 10, 1771, and studied there and at Jena. In 1802, he was appointed a professor at Marburg, and in 1804 obtained the chair of Philology and Ancient History at Heidelberg, which he occupied for 44 years in the worthiest manner. In 1848, he retired into private life, the infirmities of age having forced him to renounce the fatigue of teaching. He died at Heidelberg, 15th February 1858.

C.'s whole life has been devoted to the study of antiquity. His first, and probably his greatest work, was *Symbolik und Mythologie der alten Völker, besonders der Griechen* (4 vols., Leip. 1810—1812). This treatise, which asserted the symbolical character of ancient mythologies, excited a lively controversy, in which Hermann and Voss appeared as the opponents of Creuzer. His next work in importance was a complete edition of the works of Plotinus (3 vols., Oxford, 1835). Along with G. H. Moser, C. edited several works of Cicero—*De Natura Deorum* (1818), *De Legibus* (1824), *De Republica* (1826), and *De Divinatione* (1828), &c. Between 1837 and 1848, he published a partial collection of his writings in 10 vols. (*Deutsche Schriften.* Leip. and Darms.), the last of which contains an autobiography of C. under the title *Aus dem Leben eines alten Professors.* He is also the writer of essays on archæological topics too numerous to be mentioned. In 1854 appeared *Friderici Creuzeri Opuscula Selecta.*

**CRÈVECOEUR** (*Heart-breaker*), the name of a Dutch port in the province of North Brabant, on the left bank of the Meuse, where this river receives the Dieze, about 4 miles north-north-west of Bois-le-Duc. It figures somewhat prominently in the wars of the Dutch and Spaniards.

**CREVILLE'NTÉ**, a town of Spain, in the province of Alicante, about 20 miles west-south-west of the city of that name. It is situated at the foot of the hills forming the boundary of Murcia, and has a population of about 7000, who are chiefly engaged in weaving and in agricultural pursuits.

**CREW**, of a ship, is a collective name for all the persons employed therein, but usually limited to designate non-commissioned officers and seamen only. In men of war, the entire C. are divided into five groups: 1. Subordinate and warrant officers; 2. Chief petty officers; 3. First-class working petty officers; 4. Second-class working petty officers; 5. All below the 4th group. In the very largest war-steamers now afloat, there are upwards of 80 different ranks, grades, or offices among the crew.

Besides the above classification of all the hands on board as members of one C., there are certain minor groups, each consisting of men employed in special work; such as the sailmaker's C., cooper's C., armourer's C., carpenter's C., cockswain's C., boatswain's C., &c.

In a merchant-ship, under the new Mercantile Marine Act, the master, before he starts on a voyage, must send a list of his C. to the customs' comptroller at the port of departure, and a similar list within forty-eight hours after his return. The masters of coasting-vessels, however, are required to do this only twice a year. Emigrant officers insist that ships to Australia shall have four seamen as C. to every 100 tons burden, and three to ships bound for America. In the large sea-going steamers, however, the number of hands is relatively greater, owing to the various duties relating to the machinery; a steamer of 1000 tons will have as many as 60 or 70 hands, if bound for a long voyage.

**CREWE**, a town in the south of Cheshire, forming a central station of five important railways, to which it owes its present importance. Pop. 4491, chiefly employed in the railway stations and foundries, and in the manufacture and repairing of railway carriages and locomotives.

**CREW'KERNE**, a town in the south-east of Somersetshire, in the fertile valley of the Parret and Isle, 10 miles south-south-west of Ilchester, and surrounded by a wide amphitheatre of highly cultivated hills. Pop. 4498. The chief manufactures are sailcloth, sacking, hair-seating, webbing, and girths. Its weekly markets, and annual fair, which is held on September 4th, for sheep, cattle, and horses, are much frequented and well supplied. The word C. means 'hermitage of the cross.'

**CRI'BBAGE** is a game with cards, played by two, three, or four persons, the whole pack being used. When three are engaged, each plays for himself; when four, they take sides. The value of the cards is the same as at whist; but there are no trumps. The number of cards dealt is usually five or six, the mode of playing the game varying slightly with the number of cards used. The points are scored on a board with holes for pegs, and 61 constitutes game. The terms used in the game are as follow: *Crib*, the cards laid out by each party, the points made by them being scored by the dealer. *Pairs* are two similar cards, as two aces or two kings; they reckon for two points, whether in hand or playing. *Pairs royal* are three similar cards, and reckon six points. *Double pairs royal* are four similar cards, and reckon twelve points. These various points are thus made: if your adversary plays a seven, and you another, a pair is made, which entitles you to two points; if he then play a third seven, he makes a pair royal, and marks six; and if you play a fourth seven, it constitutes a double pair royal, and entitles you to twelve points. *Fifteens.*—If any combination, whether of two or more cards, in your hand, or in play, make together fifteen, such as a ten and a five, a two, a five, and an eight, &c., you reckon two points. *Sequences* are three, four, or more successive cards, and reckon for an equal number of points; and in playing a sequence, it is of no consequence which card is played first; for instance, if your adversary plays an ace, and you a five, he a three, you a two, and he a four, he scores five for the sequence. *Flush* is when the cards are all of one suit, and reckons for as many points as there are cards. A knave of the same suit as the turn-up card counts for one in any hand. If a knave be turned up, it counts two for the dealer. For full directions for playing the game, see *Chambers's Information for the People*, article 'Indoor Amusements.'

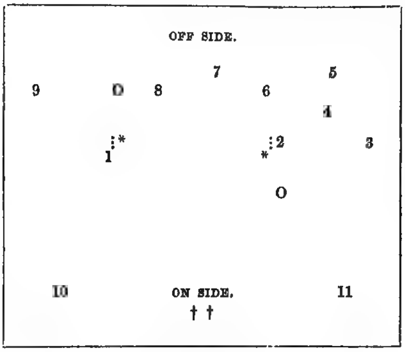
**CRI'B-BITING** is a bad habit met with especially in the lighter breeds of horses, and those spending a considerable amount of leisure in the stable. The act consists in the animal seizing with his teeth the manger, rack or any other such object, and taking in at the same time a deep inspiration, technically called *wind-sucking*. C. springs often from idle play, may be first indulged in during grooming, especially if the operation is conducted in the stall, and the animal be needlessly teased or tickled; is occasionally learned, apparently, by imitation from a neighbour; and in the first instance is frequently a symptom of some form of indigestion. Its indulgence may be suspected where the outer margins of the front teeth are worn and rugged, and will soon be proved by turning the animal loose where he can find suitable objects to lay hold of. It usually interferes with thriving and condition, and leads to attacks of indigestion. It can be prevented only by the use of a muzzle or throat-strap; but in those newly acquired cases resulting from gastric derangement, means must further be taken to remove the acidity or other such disorder.

**CRICE'TUS.** See HAMSTER.

**CRI'CHTON**, JAMES, surnamed the 'ADMIRABLE,' was a native of Scotland, where he was born in 1551, or, according to others, in 1560. His father, Robert Crichton of Elliock, in the county of Perth, was Lord Advocate of Scotland from 1561 to 1573. On the mother's side, C. was descended from the old Scottish kings, a circumstance of which he used to boast on the continent. He was educated at St Andrews University. Before he reached his 20th year, he had, it seems, 'run through the whole circle of the sciences,' mastered ten different languages, and perfected himself in every knightly accomplishment. Thus panoplied in a suit of intellectual armour, C. rode out into the world of letters, and challenged all and sundry to a learned encounter. If we can believe his biographers, the stripling left every adversary who entered the lists against him *hors de combat.* At Paris, Rome, Venice, Padua, Mantua, he achieved the most extraordinary victories in disputation on all branches of human knowledge, and excited universal amazement and applause. The beauty of his person and the elegance of his manners also made him a great favourite with the fair; while, as if to leave no excellence unattained, he vanquished, in a duel, the most famous gladiator in Europe. The Duke of Mantua, in whose city this perilous feat was performed, appointed him preceptor to his son, Vincentio di Gonzago, a dissolute and profligate youth. One night, during the carnival, C. was attacked in the streets of Mantua by half-a-dozen people in masks. He pushed them so hard that their leader pulled off his mask, and disclosed the features of the prince. With an excess of loyalty which proved his death, C. threw himself upon his knees, and begged Vincentio's pardon, at the same time presenting him with his sword. The heartless wretch plunged it into the body of his tutor. Thus perished, in the 22d year of his age, the 'Admirable Crichton.'

What measure of truth there may be in the hyberbolical eulogies of his biographers, it is impossible to determine, as C. left no writings by which they might have been judged.

**CRI'CKET** (of doubtful derivation), a well-known game, is of very ancient date. The author of the *Cricket Field*—one of the best manuals on the subject—believes it to be identical with 'Club-ball,' a game played in the 14th c.; it went originally by the name of 'handyn and handoute.' C. is a truly national English game. There is hardly a town, village, or school, that does not own its C. ground, and military authorities hold it in such estimation as a healthy recreation, that soldiers are encouraged to occupy their leisure time in its pursuit. Of late years, C. has been introduced largely into Scotland and Ireland, and is rapidly becoming naturalised all over the world. The requirements for carrying on the game are—1st, a piece of level turf an acre or two in extent; 2d, a sufficient number of players to form two sides of eleven each, for *double* wicket, and a lesser number for *single* wicket; 3d, for double wicket (the mode in which the game is usually played), two bats, two sets of wickets and bails, and a ball. When a match is to be played between two 'elevens,' the first thing to be done is to 'pitch' the wickets. *Wickets* consist of six wooden stumps, 27 inches high, and are placed in the ground in sets of three, at a distance of 22 yards apart. On the top of each set of stumps are placed two small pieces of wood, called *bails.* The rival sides next toss for first 'innings,' and the director of the side that is to go in first, places two of his men at the wickets as batters; while a bowler, wicket-keeper, long stop, and fielders (see accompanying illustration), are placed in their several positions by the director of the opposite side. When these arrangements are satisfactorily made, and the markers or scorers are at their post, the umpires take their places, and the game begins. It may be well to mention here that the relative merits of rival sides are decided by the total number of *runs* made by each eleven batters during two innings—the side whose players score the most being, of course, victorious.



Plan of Cricket-field, shewing positions of parties engaged at double wicket:

Names of parties indicated by the figures: **, Batters; 1, Bowler; 2, Wicket-keeper; 3, Long-stop; 4, Short-slip; 5, Long-slip; 6, Point; 7, Cover-point; 8, Mid-wicket; 9, Long Field-off; 10, Long Field-on; 11, Leg; OO, Umpires; ††, Scorers. This is the usual placing of the field-men, but bowlers make such alterations as they deem best to oppose the batters.

We may further premise that the bowler's object is to direct his ball, by a swift movement of the arm, towards the opposite wickets, at which one of the batsmen stands, and, if possible, to strike down the stumps or knock off the bails; while the object of the batsman, on the other hand, is to protect his wickets from the bowler's attack, by either stopping the ball when it reaches him (blocking), or driving it out to the field. And much of the beauty of the game depends upon the precision with which the bowler can direct ball after ball in a straight line for the wickets, and the corresponding skill displayed by a good batsman in guarding them.

We will now suppose the two batsmen to be at their places, the bowler at his, ball in hand, and the other players arranged in theirs: at a signal from the umpire the bowler cries 'Play!' and immediately after, *delivers* his first ball. If the batsman misses the ball, and it passes the wicket, the wicket-keeper stops it, and returns it to the bowler, who delivers another ball, and so on. When the batsman strikes the ball fieldwards, he immediately runs to the opposite wicket, passing his companion batsman, who crosses to his, and so on, till the ball has been returned by a fielder to the wicket-keeper or bowler's hand. Thus, if the stroke be a long one, the striker may have time to run perhaps three times between the wickets before the ball is thrown up, when three 'runs' are accordingly placed at his name by the scorers, on their sheet. If, however, the bowler or wicket-keeper receives the ball, and touches the wickets with it, before the advancing batsman has reached his 'ground' or touches it with his bat, the striker is out, and another man takes his place. Besides, if a ball from a stroke of the bat be caught by one of the opposite party before it reaches the ground; or if in striking at a ball the striker hits down his wicket; or if he wilfully prevents a ball being caught, or strikes it twice; or if any part of his person stops a ball which would otherwise have hit his wicket, the striker is out. It frequently happens that two skilful batsmen guard their wickets so effectually, and score so many runs, to one particular style of bowling, that a change either of the bowler, or style of bowling, is adopted by the other side. This change, say from swift to slow bowling, or *vice versâ*, generally produces the required results, and leads to the speedy retirement of the hitherto fortunate batsmen.

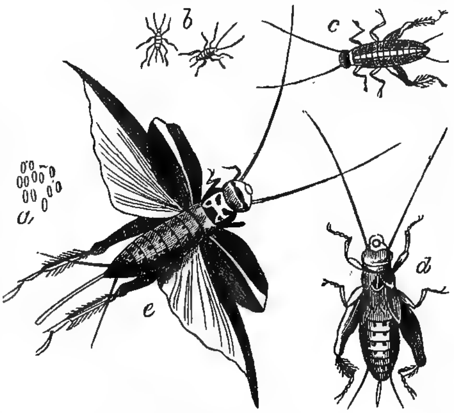
The wicket-keeper's place is a very important one, his principal duty being to stop with his hands every ball the batsman misses, it being allowable to make runs (byes) for balls that elude his grasp. Behind him stands the long stop, who is always on the outlook for balls that escape the wicket-keeper. The fielders, who are posted in various parts of the ground, ought to possess quickness of eye and foot, and skill in picking up with either hand a ball that is running, and instantly throwing it to the wickets. They must also be well skilled in catching balls. Much depends on their judgment of distance between the point at which the ball is picked up, and the wickets, as misconception of this may lead to overthrowing the ball, or throwing it short, while the batsmen are profiting by the error, and scoring additional runs. Fielders usually throw the ball to the wicket-keeper, who returns it slowly to the bowler; this saves the hands of the latter from being unsteadied by catching long balls.

At the end of every four bowls, the bowler, wicket-keeper, long-stop, and fielders, change places, and thus every four balls are delivered from alternate wickets; four balls constitute an 'over,' which it is the umpire's duty to reckon and announce.

We have said that each side is allowed *two* innings, but it sometimes happens that one side scores more runs in one innings than the other does in two; thus, A's side, we will suppose, goes in first, and its eleven men score 180; B's side then goes in, and scores, say, 80 the first innings, and 70 the next: in that case, A would be said to have won by an innings and 30 runs.

In England, there are many professional men who make a livelihood by playing matches with amateur clubs, and by instructing the latter in the art. The Marylebone and Surrey are, perhaps, the two most influential clubs in England; and for skill and science, it may safely be said, that the 'Eleven of all England,' and the 'United Eleven' (professionals), excel all other cricketers in the world. The attractions of C. seem to be fast spreading in all countries. In America, the game is played to a large extent, and with skill almost equalling that of English players. In 1859, America sent a challenge to England, who accepted it by sending her Eleven: this band of players competed with the principal transatlantic clubs, and returned to England covered with laurels. The best works on C. are *The Cricket Field* (Lond. Longmans), *Felix on the Bat*, and Lillywhite's *Guide to Cricketers* (Lond. Kent & Co.).

**CRICKET** (*Gryllus; Acheta* of some naturalists), a genus of orthopterous insects, of the section *Saltatoria* (in which the hinder legs are long, very strong, and formed for leaping), allied to locusts and grasshoppers, and the type of a family *Gryllidæ* (or *Achetidæ*). The wings are folded horizontally, and form, when closed, a slender thread-like acumination beyond the wing-covers (*elytra*). It is by the friction of the wing-covers against each other, and in virtue of a peculiarity of their structure, that the males produce the stridulous sound which makes these insects so well known. The antennæ are long and thread-like, inserted between the eyes. The best known species is the House C. (*G. domesticus*), which is about an inch long, with antennæ of almost an inch and a half, of a pale-yellowish colour, mingled with brown. It is widely distributed over Europe, particularly the south, and is common in Great Britain. Its very frequent abode is in nooks and crevices of houses, and it sometimes burrows in the mortar; the neighbourhood of the fire is very attractive to it, particularly in winter; and its merry note has, accordingly, become associated with ideas of domestic comfort and cheerfulness. Without the heat of the fire, it becomes dormant, or nearly so, in winter. It remains quiet during the day, but is lively and active at night, issuing forth to seek its food, which consists both of animal and vegetable substances. Bread-crumbs are very acceptable to it; and for the sake, apparently, both of food and warmth, it very much frequents bakehouses. The larvæ are wingless, the pupæ have mere rudimentary wings.—The Field C. (*G. campestris*) is larger, blackish, with the base of the wing-covers yellowish, feeds on herbs and roots, makes a louder noise than the House C., and is not unfrequent in some parts of England, but very rare in Scotland.—A species of C. (*G. megacephalus*) found in Sicily, makes a noise loud enough to be heard at the distance of a mile.—The Mole C. (*Gryllotalpa*) will be noticed in a separate article.



House Cricket (*Gryllus domesticus*):
*a*, eggs; *b*, young just hatched; *c*, full-grown larva; *d*, pupa; *e*, perfect insect.

**CRI'CKLADE**, a town in the north of Wiltshire, 7 miles south-east of Cirencester, in a level country, on the right bank of the Isis, one of the sources of the Thames. C. was formerly a borough town, but at present what is called the borough of Cricklade, includes, besides C., the towns of Swindon, Highworth, Wootton Bassett, and upwards of 50 parishes or districts. C. was disfranchised in 1782, and the right of voting now belongs instead to the Hundreds of Cricklade, Staple, Highworth, and a few other places. Pop. of town, 1906. The ford of the Thames here was the frequent scene of contests in former times. The town was twice plundered by the Danes, first in 905, and again in 1016.

**CRIEFF**—including the burgh of barony of Crieff and the burgh of regality of Drummond—a town on the Earn, 17 miles west of Perth. It is beautifully situated on rising ground at the foot of the Grampians, and near the entrance by the *Sma' Glen* to the Scottish Highlands. It is the second town in the county. Pop. 3824. It has woollen manufactures, besides tanneries. The mild climate of C. makes it the resort of invalids in summer. It is now eminent for its schools. St Margaret's College was opened here in 1849, for the education of young ladies of the Episcopal communion. Near is the fine scenery of Glen Almond, with Trinity College, opened in 1847, for students connected with the Scottish Episcopal church. Morrison's Academy—built at a cost of £6500, and endowed by Thomas Morrison, builder, Edinburgh, with £20,000—was opened in 1860. The railway to C. was opened in 1856. Since then C. has much improved. The greatest Scotch cattle-market stood here till 1770, when it was removed to Falkirk.

**CRILLON**, LOUIS DE BERTON DES BALBES, surnamed 'LE BRAVE,' was born at Murs in Provence, in 1541. Under Francis of Lorraine, Duke of Guise, then the model of military chivalry, he was trained for war, and at the age of 16, was accounted an accomplished soldier. In 1558, he gave the first public proof of his valour at the siege of Calais. Shortly after, he covered himself with glory at the capture of Guines. The whole army celebrated the praises of the young hero, who was introduced by Duke Francis in flattering terms to Henry II. As a reward of his numerous heroic deeds, he obtained a multitude of church benefices, which he intrusted to the care of learned clerks. In the religious wars of the 16th c., he fought against the Huguenots, and distinguished himself at the battles of Dreux, Jarnac, and Moncontour. He was likewise present at the battle of Lepanto, in 1571, and though wounded, was appointed to carry the news of the victory to the pope and the French king. In the atrocities of the St Bartholomew Massacre, C. had no part. In 1573, he took part in the siege of La Rochelle. In 1585, Henry III. made him knight of his Orders. He continued faithful to his sovereign in his struggle with the Catholic League. Henry IV. found in him a sincere friend and adviser. After the peace with Savoy, C. retired to Avignon, and, after the fashion of a true Catholic warrior, ended his days 'in the exercises of piety and penance,' December 2, 1615. The martial fire burned brightly in C., however, even in his last days; in proof of which, there is recorded the rather melodramatic story, that when listening at church one day to an account of the crucifixion, the old hero forgot himself, and brandishing his sword, cried out: 'Où étais tu Crillon?' (Where wert thou, Crillon?)

**CRIME**, in its legal, as opposed to its moral or ethical sense, is an act done in violation of those duties for the breach of which the law has provided that the offender, in addition to repairing, if it be possible, the injury done to the individual, shall make satisfaction to the community. A private wrong, or civil injury, on the other hand, is an infringement on the rights of an individual merely, for which compensation to him is held, in law, to be a complete atonement. From this definition, which is that generally adopted by lawyers (Stephen's *Com.* iv. p. 77), it is obvious that legal criminality is not a permanent characteristic attaching to an action, but one fixed upon it arbitrarily, from considerations of expediency. Without changing its moral character, the same action may, and very often is, a C. in one country or in one generation, and no crime in another country or a succeeding generation. Malice, or evil intention, however, is in all cases essential to the character of C., for though there may be an immoral act which it is inexpedient to punish as a C., it can never be expedient to punish as a C. what is not an immoral act. But it is not necessary that the evil intention shall have had reference to the party injured. If the offender acted in defiance of social duty, and regardless of order, a C. has been committed, though it may not have been the particular C. which he intended. For example, it is murder if A kill B by mistake for C, unless the killing of C would have been justifiable, or excusable. The law can take no cognizance of a bare intention, which has not ripened into any sort of act. How far *attempts* to commit C. are punishable, is always a question of difficulty. The general rule seems to be, that if such acts can be unequivocally connected with the criminal intention, they are punishable, though not to the same extent as the completed crime. Pupils under seven years of age, and insane persons, as being incapable of design or intention, are regarded in the eye of the law as incapable of C.; but questions as to the responsibility of persons labouring under partial insanity are often surrounded with practical difficulties, which are positively insoluble. The defence of *compulsion*, or *vis major*, as it is called by lawyers, if completely established in fact, is generally sufficient in law. See COMPULSION. The subjection of a servant to a master, or of a wife or child to a husband or parent, will be no defence for the commission of an act of the criminality of which the offender was aware, unless it amount to compulsion. Magistrates acting *bonâ fide*, and soldiers acting under their officers in the ordinary line of duty, are not liable to a criminal charge. Extreme want is no excuse for a C. in law, though it furnishes a ground for an application for mercy.

In the technical language of the law of England, the term *offence* has a wider signification than C., the latter including only such of the former as are punishable by *Indictment* (q. v.). Crimes are divided into *Misdemeanours* (q. v.) and *Felonies* (q. v.), the latter being a higher species of offence than the former.

**CRIME'A** (anciently, the Tauric Chersonese), a peninsula in the south of Russia, forming the greater part of the government of Taurida, in lat. 44° 44′—46° 5′ N., long. 32° 30′—36° 35′ E. It is united to the mainland only by the very narrow isthmus of Perekop, between the Black Sea and the Sea of Azof, and separated from the isle or peninsula of Taman, on the east, only by the narrow strait of Yenikalé. The C. is thus almost surrounded by water—on three sides, by the Black Sea, and on the fourth by the Sea of Azof; while a trench, 70 feet wide and 25 deep, across the isthmus of Perekop, cuts it off from the mainland. The C. is quadrilateral in shape, the four corners pointing to the four cardinal points in the compass; but a long narrow peninsula juts out on the east, which increases the extreme length of the territory from east to west to 190 miles, the breadth being 110 miles. The whole extent of the C. is between 8000 and 9000 square miles. The coast is very much broken and indented, particularly on the side of the Sea of Azof. The most easterly part of it is a mountainous peninsula, the seat of the ancient kingdom of Bosporus. From the Strait of Yenikalé, through this minor peninsula and along the whole southern coast, a chain of mountains extends, which may be regarded as a continuation of one of the chains proceeding from Mount Caucasus. This southern district of the C. is very rich and beautiful. The mountains rise with steep slopes from the sea, whilst spurs and secondary chains extend northward, richly wooded, and with most beautiful intermediate valleys, gradually sinking into the uniform and desolate steppe which forms the northern and much greater part of the peninsula. The highest mountain is Tchatirdagh, i. e., the Tent Mountain, *Mons Trapezus* of the ancients, which rises to a height of more than 5000 feet. It is a table-mountain, and has many great and deep chasms, in some of which the ice remains unmelted all the summer. The southern district of the C. is well cultivated, and is adorned by many country-seats of the Russian emperor and nobles, with parks and gardens surpassed by none in Europe. Tartar villages, mosques, and Greek convents are to be seen in most picturesque situations amongst the woods and rocks, with many ruins of ancient fortresses. The vegetation may almost be called subtropical; olive groves are frequent; the vineyards yield excellent grapes, and some of them excellent wine; and even oranges are produced. Grain of various kinds is produced abundantly, and silk, wax, and honey. Much attention is bestowed upon horses, oxen, and sheep, in which no small part of the wealth of the country consists. The northern part of the C. is in every way a contrast to the south, being little else than one waste uniform steppe, destitute of water and of wood, with a soil generally very unfit for agriculture, and with numerous salt-lakes and salt-marshes, some of which dry up in summer, and which seem to indicate that it was recently covered by the sea. The air is infected by exhalations from these marshes, and from the *Siwash* or *Putrid Sea*, which is a portion of the Sea of Azof, but is almost cut off from it by a narrow tongue of land called the Peninsula of Arabat. In the summer and autumn, a most offensive and powerful smell arises from the stagnant water, but the evaporation is often so complete that the Siwash is left dry, and horses can cross upon the hardened ground, where at other seasons vessels may sail. The capital of the C. is Simferopol (q. v.); the old Tartar capital is Baktshi-serai (q. v.), both situated in the interior. Sevastopol (q. v.) is situated in the south-west; Kaffa and Kertch are situated in the south-east; Perekop on the isthmus to which it gives its name, in the north. Through the gate of Perekop, great quantities of salt pass northward, the produce of the salt-lakes of the Crimea. The small river Alma, on whose banks the first battle was fought between the Russian troops and the French and English invading army (20th September 1854), falls into the Black Sea, where the picturesque southern district approaches the northern steppe.

The population of the C. amounts to about 200,000, about two-thirds of whom are Tartars; the remainder consist of Russians, Germans, Greeks, &c. The chief features in the early history of the C. are given under the head BOSPORUS (q. v.). The Tartars conquered the territory in the 13th c., and converted it into the khanat of Krim Tartary. The Genoese under these rulers planted flourishing colonies here, which were destroyed by the Turks, who came into possession of the country in the 15th century. Russia finally subjected the C. in 1783.

**CRI'MEN REPETUNDA'RUM**, the crime of accepting a bribe by a judge. See BARATRY, JUDGE.

**CRI'MINAL**, one who has been convicted of a crime. A person indicted for a criminal offence is often called a culprit in England; and when undergoing trial in the Court of Justiciary in Scotland, he is spoken of as the panel, a word which has a different signification in England. See PANEL.

**CRIMINAL CONVERSATION.** See ADULTERY.

**CRIMINAL COURTS.** See JUSTICIARY, COURT OF.

**CRIMINAL INFORMATION.** See INFORMATION.

**CRIMINAL LAW.** See CRIME, PROSECUTION, PUBLIC PROSECUTOR.

**CRIMP** is the name given to an agent for supplying ships with seamen, just before a voyage; he receives so much per head for his trouble. This offensive name is applied to these persons, because in general they make use of untruthful representations and other unfair means to entrap sailors into service. Crimps are numerous in all large seaports, and are usually in league with publicans and prostitutes to deprive seamen of their wages. They also keep a sharp look-out for emigrants, and convey all who are simple enough to put faith in their statements to low lodging-houses in which they have an interest. The mere charge for lodging is often small, but the lodgers are cheated by provision-merchants and others who pay the C. a liberal commission on their custom. Fairly conducted, the C.'s business is no more objectionable than any other agency, and within recent years the system has been greatly improved by the operation of the 'Passengers' Act' and 'Mercantile Marine Act,' and especially by the appointment of registrars of seamen and government emigration agents.

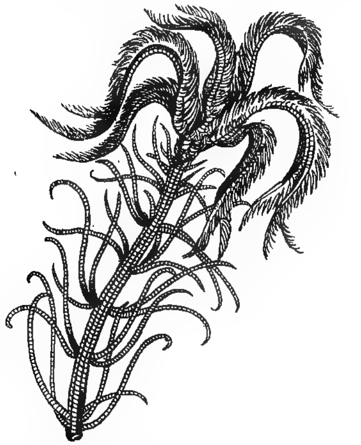
**CRI'MSON.** See RED.

**CRI'NAN CANAL, THE**, is an artificial water-communication 9 miles long, in the west of Argyleshire, between Loch Gilp, a branch of Loch Fyne, and Loch Crinan, in the Sound of Jura, at the head of the peninsula of Cantire. It was constructed to avoid the circuitous passage of 70 miles round the Mull of Cantire, on the route from Glasgow to Inverness by the Caledonian Canal. It is 24 feet broad, and 12 deep, has 15 locks, and admits vessels of 200 tons. It was excavated in the end of last century, and cost £183,000. After a continuance of heavy rain in February 1859, the three reservoirs supplying the canal with water (the highest being 800 feet above the canal) burst, and a torrent of water rushed down the mountain-slope, washed away part of the canal banks, and filled the canal with débris and stones for upwards of a mile. Government repaired the damage at the cost of £12,000. In the year ending April 1859, 1606 vessels passed through the canal, and the income was £2238, and the expenditure £2149.

**CRINED** (Lat. *crinis*, the hair), a term in Heraldry. When the hair of a man or woman, or the mane of a horse, differs in tincture from the rest of the charge, the object is said to be *crined*, of such a metal or colour.

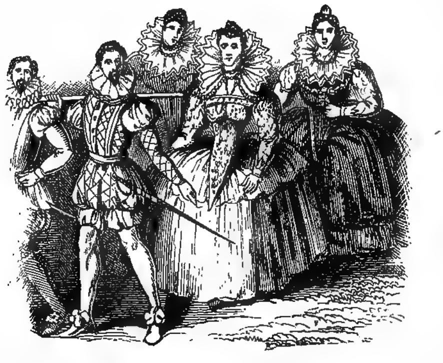
**CRI'NGLES**, short pieces of rope, with each end spliced into the bolt rope of a sail; commonly confining an iron or brass ring or thimble. Smaller ropes are passed through them, to aid in managing the sails.

**CRINOI'DEÆ** (Gr. lily-like), an order or family of radiate animals of the class *Echinodermata* (q. v.), of which the recent species are few, but the fossil species so very numerous as to constitute great tracts of the dry land as it now appears. The C. have a central disc, in which is contained the digestive cavity, with two orifices, and from which arise arms or rays, five in number, but soon subdividing, so as at first sight to appear more numerous, and again subdividing into lateral appendages, either fin-like or filamentous, the disc as well as the rays and their subdivisions formed of a calcareous jointed skeleton, clothed with a fleshy integument, of which the fin-like expansions are formed, and which is thicker than in star-fishes, and contains imbedded in it the innumerable ovaries. The joints are also extremely numerous, and the subdivision of the rays often very great. The disc is composed of calcareous pieces and fleshy integument like the rays, as is also a stalk on which the whole is usually supported; the base, it is supposed, being fixed, and the disc and rays expanding like a flower. It appears probable that many of the fossil C. were permanently fixed in this manner, and this is supposed to be the case with the species of *Pentacrinus* still existing, as the *P. caput Medusæ*, or Medusa's Head of the West Indian seas; but others are fixed only when young, the disc and arms finally becoming detached from the stalk and moving freely in the sea, swimming in a manner analogous to that of the medusæ. This interesting fact was first discovered by Mr J. V. Thompson, who found in the sea near Cork the stalked young of the *Comatula rosacea*, a small but very beautiful species, and the only species of the C. found in the British seas. See ENCRINITES.



Encrinus.

**CRI'NOLINE** (Fr., from Lat. *crinis*, hair) was the name originally given by the French *modistes* to a fabric made of horse hair, capable of great stiffness, and employed to distend women's attire; it is now applied in a general way to those structures of steel wire or hoops, by means of which women have recently attained such overwhelming dimensions. This fashion of expansion is not new. The first name we find given to it is the *fardingale*, introduced by Queen Elizabeth. Walpole, in his fancy description of her, speaks of her 'enormous ruff and vaster fardingale.' The upper part of the body was encased in a cuirass of whalebone, which was united at the waist with the equally stiff fardingale of the same material, descending to the feet, without a single fold, in the form of a great bell. Gosson mentions the fardingale in 1596, in his *Pleasant Quippes for Upstart Newfangled Gentlewomen.* In the end of the reign of James I., this fashion gradually declined, and was further tamed down by Puritan feeling in the time of Charles I. and Cromwell, till it quite disappeared. We next hear of it in 1711 as 'that startling novelty the hoop petticoat,' which differed from the fardingale in being gathered at the waist. Sir Roger de Coverley is made to say of his family pictures: 'You see, sir, my great-great-grandmother has on the new-fashioned petticoat, except that the modern is gathered at the waist; my grandmother appears as if she stood in a large drum, whereas the ladies now walk as if they were in a go-cart.' The 'large drum' was the old fardingale, and 'the new-fashioned petticoat' was the more modern hoop, over which, in Sir Roger's time, the dress was looped up round the body in front, and fell in loose folds behind. Hogarth, in his night-scene in 'Marriage à-la-Mode,' introduces on the floor a hoop of the time of George II.; and about 1744, hoops are mentioned as so extravagant, that a woman occupied the space of six men. An elongated, oval form also came into fashion, raised at each side to shew the high-heeled shoes, causing caricaturists to say that a lady looked like a donkey carrying its panniers. Facetious proposals were also made that coaches should have movable roofs, the ladies to be dropped in from the top by means of frames and pulleys. These hoops were of whalebone, with canvas over them, having capacious receptacles on each side for articles of convenience. In 1780, we find hoops of cane used, being advertised to 'outwear the best sort of whalebone.' About the year 1796, hoops had been discarded in private life, but were still the mode at court, and never had been seen in more full-blown enormity, continuing so to the time of George IV., when they were abolished by royal command.



Ladies in time of Queen Elizabeth, shewing how the Fardingale was worn.

A collapsed Hoop.

We now come to the recent development of this fashion in our own day, which began with C. in its original and proper sense, first in the form of the inelegant 'bustle' in the upper part of the skirt, then the whole petticoat. Instead of the hair fabric, some used, for economy, cotton, thickly corded and starched. At length, about 1856, people were startled by the question: 'Have you heard that Miss So-and-so actually wears a hoop?' and it became apparent that the fashion of Queen Anne's time had returned upon us, only that the structure was somewhat lighter and more pliant; being usually composed of a series of horizontal small steel hoops, held together either by vertical bands, or by being sewed into a kind of petticoat. Unlike former times of hoops and fardingales, the fashion has descended even to maid-servants, so that where the dining-room is small, table-maids have been known to give warning, because they could not clear the space between the table and the fire; and the newspapers are continually announcing 'Accident from Crinoline,' or 'Lady burned to Death from Crinoline.' Nay, the newspapers from time to time inform us of such accidents as these: 'A publican's wife, passing through the cellar, unconsciously drew a stop-cock open with her crinolined dress, and spilt 14 gallons of the best Islay whisky;' or, more disastrous by far: 'A mill-girl was caught up in the machinery by her crinoline, and immediately killed.' The old-fashioned hoop had this advantage, that it descended as low as the dress; whereas the present hoop stops short of the skirt, and is discovered by its inelegant 'swagging' from side to side, as the wearer walks along. The *Spectator* dealt out much cutting, though playful raillery on the hoops of his day, but apparently with little effect; and equally unavailing are the satires of *Punch* and other caricaturists of the present time against the hideous fashion of crinoline. It may, without exaggeration, be described as a social nuisance. Owing to its prevalence, church pews that formerly held seven are now let for six, and yet feel rather crowded. The hoops are sometimes made with a circumference of four, and even five yards.

**CRI'NUM**, a genus of bulbous-rooted plants of the natural order *Amaryllideæ*, having long tubular flowers, the segments of the perianth hooked at the apex, the stamens straight and inserted into the tube, and a three-celled capsule. It contains a considerable number of species, natives of different tropical and sub-tropical countries, generally with umbels of large and beautiful flowers, some of them amongst the most admired ornaments of our hot-houses. *C. amabile*, an Indian species, is much esteemed for its fragrance as well as its beauty, and flowers about four times a year. All the species require a rich open soil, plenty of room for their roots, and the frequent removal of suckers.—The bulbs of *C. Asiaticum* are powerfully emetic, and are used in some parts of the East in cases of poisoning.

**CRIS-CROSS ROW.** See CHRIST-CROSS.

**CRI'SIS** (Gr. a judgment, from *krino*, I judge), a name used by the ancient physicians to denote the rapid or sudden determination of an acute disease in the direction of convalescence or of death. It was opposed in signification to lysis (*luo*, I relax), which denoted the gradual subsidence of the symptoms noticed in most chronic, and in some acute diseases. The doctrine of crises was closely bound up with that of a *materies morbi*, or material of disease in the blood, which was presumed to be undergoing changes, during the whole course of the malady, tending to an evacuation of some kind from the system in the form of a critical discharge (*apostasis* or *abscess*), which, when observed, was supposed to contain the matter of disease in a state of *coction*, and to be the direct cause of the sudden relief of the patient. Thus, according to the character and seat of the critical discharge, it was common to speak of a C. by sweating, by diarrhœa, by expectoration, by urine, by parotid swellings, &c.; and no C. was considered regular that was not attended by some symptom of this kind. Another curious doctrine associated with that of crises, was the belief in certain days as ruling the beneficent or injurious, the complete or incomplete, character of a crisis. The seventh, fourteenth, and twentieth (according to some, the twenty-first) days of the disease were regarded as eminently critical; less so, but still favourably critical, were the third, fifth, eleventh, and seventeenth; the fourth day was the *indicator* of a complete C. on the seventh; the sixth day was the *tyrant*, notorious for unfavourable crises; the second, eighth, tenth, thirteenth, and the rest were non-critical. Few physicians now attach much importance to critical days, but the doctrine of crises and of a *materies morbi*, is still taught, with various modifications, in our medical schools and text-books.

**CRI'SPIN**, a saint and martyr, was descended from a noble Roman family. About the middle of the 3d c., under the reign of Diocletian, he, along with his brother Crispianus, fled from Rome into Gaul, where he worked as a shoemaker in the town which is now called Soissons, and distinguished himself by his exertions for the spread of Christianity, as well as by his works of charity. According to the legend, his benevolence was so great that he even stole leather to make shoes for the poor! From this, charities done at the expense of others have been called Crispinades. In the year 287, he and his brother suffered a most cruel martyrdom. Both brothers are commemorated on the 25th October. King Crispin, as he is called, is the universally recognised patron saint of shoemakers, and is represented with dramatic effect in the ceremonial processions of the 'gentle craft.' There is an amusing but scarce book about shoemakers, entitled *Crispin Anecdotes*.

**CRI'THMUM.** See SAMPHIRE.

**CRÖA'TIA**, a kingdom forming part of the Austrian Empire. With Fiume and the Croatian *Litorale* or Maritime District, and the Croatian Military Border, it has an area of about 4200 square miles, and 608,426 inhabitants. It lies to the north-east of the Adriatic, and borders with Turkey and Hungary. C. is traversed by low chains of mountains, in the south proceeding from the Julian Alps, and in the north from the Carnic Alps. These mountains are generally covered with forests, and the chains are separated by very fertile valleys. The principal rivers are the Save and its affluent the Culpa, the Drave and its affluent the Mur. Some of the valleys, especially in the south, are quite shut in, so that many of the streams have to make their way through subterranean channels. The climate much resembles that of the neighbouring parts of Hungary, the more southern situation being counterbalanced by the greater elevation. The inhabitants are mostly of Slavonic race and language. The religion of C. is that of the Roman and Greek Churches. The Croatians are warlike, but the name *Croats* is employed to designate light-cavalry regiments in the imperial army, in which Magyars and others are mingled with true Croatians. Grain, chestnuts, wine, and gall-nuts are amongst the principal exports of Croatia. The keeping of cattle is neglected. The wood of the great forests, although much of it is admirably adapted for shipbuilding, is turned as yet to little account. The *Litorale* or coast district contains valuable marble quarries. The capital of C. is Agram (q. v.). C. with its *Litorale* and Slavonia (q. v.) form a crown-land, at the head of the administration of which is the Ban (q. v.) of Croatia.

C. was, in the earliest historic times, inhabited by the Pannonians, who were conquered by the Romans under Augustus, and the country made a province of Illyria. During the irruptions of the northern nations into the Roman empire, C. suffered a variety of vicissitudes. In 640, the Croats, Chrovats, or Horvats, migrated into it from the Carpathian Mountains, and gave it its present name. In the 14th c., having previously been in some measure incorporated with Hungary, C. was more completely united with that kingdom, and passed with it, in the beginning of the 16th c., to the Austrian House of Hapsburg. In the end of the 16th c., the Turks conquered a portion of it, now known as Turkish Croatia. The city of Fiume was declared in 1797 to be a constituent and integral part of the kingdom of Hungary; and after the termination of the French wars, Fiume remained united to Hungary till 1848. The Croatians long entertained a feeling of hostility to the Magyars, which manifested itself in 1848 and 1849 in a manner very unfavourable to the cause of the Hungarian revolution; but recently this has greatly, if not altogether disappeared, through the effect of the foolish and faithless conduct of Austria towards both. See MILITARY FRONTIERS.

**CROCHET** (a French word signifying a hook), a species of handiwork, which may be described as an extensive system of looping, by means of hooks made for the purpose. You take a hook of a size proportioned to the fineness of the cotton or wool employed, and begin by making a chain of loops. You then turn, and with your hook still in the last loop, begin the double process of catching the thread through each loop of the chain, and also through that in which your hook is, and thus form another chain attached to the first, and so on. This is called simple or plain crochet. Endless varieties of patterns may be formed, and lightness and elegance attained, by twisting the thread one or more times in taking up the loop, and open work is formed by passing one or more loops. This work may be made round by beginning with a very few loops, joining the first to the last, and then proceeding to take several loops through one, and so widening on. C. has this advantage over knitting, that by drawing the last loop, and leaving it wide, there is no fear of the work running down as happens when knitting-needles slip. Shades of the same colour, and varieties of colours in wool as well as in silk, are used for this work. In white cotton, C. can be made available, from large bed-quilts to delicate lace-like edgings. See numerous small books describing and giving patterns of crochet.

CRO'CKETS, in Gothic Architecture, are projecting leaves, flowers, or bunches of foliage, used to decorate the angles of spires, canopies, pinnacles, &c. The varieties of C. are innumerable, almost every kind of leaf and flower being copied for the purpose. The first illustration, from Parker, is copied from Salisbury Cathedral. The other illustration represents a C. from St Alban's Abbey, of about 1240. C. only appear in pyramidal and curved lines, never in horizontal ones.

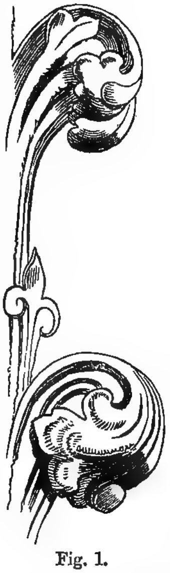


Fig. 1.

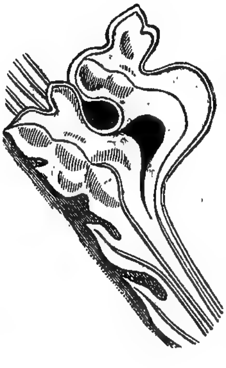


Fig. 2.

CRO'CODILE (*Crocodilus*), a genus of Saurian reptiles, the type of the family *Crocodilidæ;* which some naturalists have erected into a distinct order of reptiles (*Loricata*), on account of the square bony plates with which their bodies are covered, instead of the scales of the other saurians—the greater solidity of the skull—the lungs not descending into the abdomen—and the approach which they make to mammalia and birds in the structure of the heart. The heart has two auricles and two ventricles; but a mixture of arterial and venous blood takes place at some distance from the heart, so that the hinder part of the body receives an imperfectly aërated blood, which, however, is supposed to be further aërated in the surface of the peritoneum, two curious openings admitting the water, in which these animals ordinarily live, into the internal cavity of the abdomen. The *Crocodilidæ* may be described as lizard-like in form, with a great gape, indicative of their characteristic voracity, and with the tail flattened at the sides, so as to become a powerful organ of propulsion in water. The fore-feet have five toes, the hind-feet four, the three inner ones only being armed with claws: the feet are more or less webbed. Each jaw has a single row of numerous large teeth, which are conical and directed backwards; planted in distinct sockets, and becoming hollowed at the base, to admit the crowns of the new and larger teeth which are to succeed them as the animal increases in size. Small ribs are attached to the vertebræ of the neck, which give it a peculiar stiffness, and make it difficult for the animal to turn; and persons pursued by crocodiles may therefore make their escape by rapid turning. The eggs of the *Crocodilidæ* are hard, and small in comparison with the size ultimately attained by the animal itself. The females of some, if not of all the species, guard their eggs, and take care of their young; although the eggs, buried in the sand or mud, are hatched by the heat of the sun alone. The *Crocodilidæ* swallow stones, apparently to assist digestion. They prey on fishes and warm-blooded animals; most of them seem to prefer food in a state of incipient putrefaction, and they are even said to hide their prey, and to return to it when it has reached this state. Some of the larger kinds do not scruple to attack man.—All the *Crocodilidæ* are large reptiles; they are found in fresh waters and estuaries in the warm parts of the world; none are found in Europe, nor, as far as is yet known, in Australia. They are divided into Gavials, Crocodiles, and Alligators (the latter including caymans).—The true Crocodiles are found both in the Old World and the New. The muzzle is not slender and elongated, as in the gavials, but oblong and flattened; the teeth are very unequal in size, the long fourth teeth of the lower jaw fitting into *notches* of the upper, not into pits, as in alligators. To this genus belongs the C. of the Nile (*C. vulgaris*), which abounds also in many other rivers of Africa. It is of a bronzed green colour, speckled with brown, lighter beneath, and is sometimes 30 feet long. It often seizes human beings for its prey. In Park's *Travels*, an instance is recorded of a negro, one of his guides, who was thus seized in the Gambia, and escaped by thrusting his fingers into the crocodile's eyes. The ancient Egyptians held it sacred, and being exempted from all danger on the part of man, it became more bold and troublesome. The individuals particularly selected as the objects of idolatrous worship were tamed, and took part in religious processions. *Souchis* was the name of the deified individual, the C. god.—The DOUBLE-CRESTED or INDIAN C. (*C. biporcatus*), is very abundant in many parts of Asia, in rivers and estuaries, and is also dangerous to man. The smaller marsh C. (*C. palustris*), abundant in stagnant waters in the same regions, flees from man, and often seeks to hide itself in the mud, into which it thrusts at least its snout, then remaining contented, as if in perfect safety.

Crocodile's Tooth: Shewing the hollow at the base in which the summit of the new tooth is sheathed.

Crocodiles often bury themselves in the mud in droughts, and so abide till rain falls.—The names C. and Alligator are often indiscriminately used in popular language.

**CRO'CUS**, a genus of plants of the natural order *Iridaceæ.* The species have much general similarity, and are natives chiefly of the south of Europe and of the East. Several have been described as British, but are rather naturalised than native. Saffron (q. v.) is the produce of *C. sativus.* Some of the species are much cultivated in gardens for the beauty of their flowers, particularly those which, as *C. vernus* and *C. luteus*, flower very early in spring. The saffron C. and some other species flower in autumn. The flowers of one or two species are fragrant. It is necessary frequently to take up C. roots and plant anew, on account of the manner in which the corms multiply. See CORM.

**CROCUS OF ANTIMONY** is the oxysulphide of Antimony (q. v.).

**CROCUS OF MARS** is the finely divided red oxide of iron.

**CRŒ'SUS**, the last king of Lydia, succeeded his father, Alyattes, in 560 B. C. He made the Greeks of Asia Minor his tributaries, and extended his kingdom eastward to the Halys. From his conquests, his mines, and the golden sand of the Pactolus, he accumulated so much treasure, that his wealth has become proverbial. He gave himself up to a life of pleasure and sumptuous extravagance, and is said to have deemed himself the happiest man in the world, and to have been displeased when Solon, on a visit to his court, told him that no man should be called happy till his death. He soon found how uncertain was a happiness such as his; for his beloved son Atys was killed while hunting, and there was left to him only one son, who was dumb; and having engaged in war with Cyrus, he was totally defeated, his kingdom conquered, and himself made prisoner, and condemned to be burnt (546). At the funeral pyre, his repeated exclamation of 'O Solon!' drew on him the attention of the conqueror, and the reason of it being known, his life was spared, and he was treated with great kindness. Cyrus gave him for a residence the city of Barene, near Ecbatana, and is said to have consulted him in his military undertakings, a statement which, if true, indicates that C. by no means lacked native ability. Herodotus informs us that he accompanied Cambyses, the son of Cyrus, to Egypt, and while there, incurred great danger by the boldness with which he condemned, on one occasion, the cruel conduct of the Persian king. The time of his death is unknown.

**CROFT** (Ang. Sax. *croft*), a piece of land connected with a humble kind of dwelling, whose inhabitant, the renter of the land, is called a crofter, and this method of letting small pieces of land, either for tillage or the rearing of cattle, is known as the crofting system. This kind of petty farming, of which there were at one time many examples in Scotland, more particularly in the Highlands, is now very generally given up as inexpedient. See AGRICULTURE, FARM, SPADE-HUSBANDRY.

**CRO'IA**, or **CRO'JA**, a town of Upper Albania, European Turkey, 45 miles south-east of Scutari. It is situated on a mountain spur, rising about 500 feet above the plain, and its strong position is defended by a castle. It is the chief town of the Mirdites, a nearly independent Roman Catholic people. Pop. 6000. The famous Scanderbeg was born here.

**CROIX**, STE. (or **SANTA CRUZ**), in English, *Holy Cross* or *Holyrood*, or, somewhat barbarously, *St Cross*, an island, the most southerly and extensive of the Virgin group, is the principal Danish possession in the West Indies. With an area of about 100 square miles, it contains about 25,000 inhabitants, being generally cultivated like a garden. —St C. is also the name of a river, otherwise known as the Schoodie, and also as the Passamaquoddy, which falls into Passamaquoddy Bay, on the west side of the entrance of the Bay of Fundy. It is the boundary throughout between the state of Maine and the province of New Brunswick, having been so defined, from its mouth to its source, by the international treaty which recognised the independence of the United States. The St C. is about 55 miles long, its lowest 12 miles being navigable for large vessels.

**CRO'KER**, JOHN WILSON, an English politician and *littérateur* of considerable notoriety, was born at Galway, in Ireland, December 20, 1780. Having been educated at a school in Cork, and at Trinity College, Dublin, he entered Lincoln's Inn as a law-student in 1800, and was called to the Irish bar two years afterwards. His first literary attempt was a satire on the Irish stage, which exhibited much caustic cleverness. This was in 1803; and in 1805, he published another equally clever satire on the city of Dublin, entitled *An Intercepted Letter from Canton.* Both productions proved a great success, running through several editions. In 1807, he issued a treatise on the *State of Ireland, Past and Present*, which brought him into some notice, and, in the same year, he was elected member of parliament for Downpatrick. A warm defence in parliament, in 1809, of the Duke of York, charged with corrupt administration at the Horse Guards, helped C. in the same year to the office of Secretary to the Admiralty, a post which he held for twenty years. He was one of the founders of the *Quarterly Review*, and contributed many of the most violent party articles to its pages, as well as a large number of those bitterly personal and grossly abusive reviews which were wont to disfigure that periodical. As 'Rigby,' allowance being made for the satire, his character is not badly hit off by Disraeli, in *Coningsby.* In parliament, C. steadily opposed the Reform Bill in all its stages, and its enactment ended his parliamentary career; but on all questions relative to the promotion of the fine arts, he was much ahead of the great majority of the Commons. He took an active part in the establishment of the Athenæum Club, and rendered good service to literature by his annotated edition of Boswell's *Johnson*, and his publication of the *Suffolk Papers*, and Lord Hervey's *Memoirs of the Court of George II.* His *Stories from the History of England for Children*, supplied Scott with the idea of *Tales of a Grandfather.* C. died August 1857.

**CROKER**, T. CROFTON, a popular author and collector of Irish stories and legends, was born in Cork, January 15, 1798. He early devoted himself to the collection of legends and songs of the Irish peasantry; and, in 1824, he published his *Researches in the South of Ireland*, characterised by a happy blending of humour and sentiment, with archæological learning. This work was followed by the *Fairy Legends and Traditions of the South of Ireland* (1825); *Legends of the Lakes* (1828); *Daniel O'Rourke*, a sort of Irish Munchausen (1828); *Barney Mahoney* (1832); *My Village* (1832); and *Popular Songs of Ireland* (1839). Of all these works, *Barney Mahoney* and *My Village* are the most original: the others partly consist of compilations; but all are marked by sound knowledge of their subjects, and a *con amore* style of writing. C. also edited *Memoirs of Joseph Holt, General of the Irish Rebels*, a very interesting work, which was published in 1838. He devoted much time, and rendered considerable service, to archæology, being member of many antiquarian societies. Through the influence of John Wilson Croker, a friend, but no relative, he, at the age of 21, obtained a clerkship in the Admiralty, where he rapidly rose until he had £800 per annum. He retired from the Admiralty in 1850, with a pension of £580, and died August 8, 1854.

**CROLY, REV. DR GEORGE**, an English poet, romance-writer, and preacher, of considerable reputation, was born at Dublin, about 1785, and educated at Trinity College there. He entered the English Church, and ultimately became Rector of St Stephen's, Walbrook, London. His first work was a poem, entitled *Paris in* 1815. From this time up to within a short period of his death, which took place November 24, 1860, his pen was almost incessantly at work—on satire, comedy, tragedy, romance, tales, biography, magazine articles, and the weightier matters of religion. Few subjects came amiss to him, and he exhibited considerable talent in the treatment of most that he touched upon. His best known work is the romance of *Salathiel*. C. was also famous for his eloquence as a pulpit orator.

**CRO'MARTY**, a parliamentary burgh and seaport in the united counties of Ross and Cromarty, on a low peninsula between the Moray and Cromarty Firths, on the south side of the entrance into the latter, and 18 miles north-north-east of Inverness. It is irregularly built, and its older streets and lanes are in the homely Flemish architecture prevalent in the old towns of the north of Scotland. The harbour admits vessels of 400 tons, and the bay affords excellent anchorage for wind-bound vessels. Pop. 1988. It has manufactures of ropes, sacking, sailcloth, beer. The chief industry is the herring and white fisheries. C. has declined much since the rise, on the north side of Cromarty Firth, of Invergordon, which is more contiguous to the important districts of Easter and Wester Ross. C. unites with Kirkwall, Wick, Dingwall, Dornoch, and Tain, in returning a member to parliament. In the vicinity of C. are a lighthouse and coast-guard station, and within two miles are some caves, and an arch, called Macfarquhar's Bed, in the old red sandstone, which rises in some parts 250 feet. Near C. are remains of ancient chapels and camps. Hugh Miller, in whose memory a monument has been erected in the neighbourhood, was a native of Cromarty.

**CROMARTY FIRTH**, a landlocked inlet of the North Sea, on the north-east coast of Scotland, just north-west of the Moray Firth, and enclosed by parts of the counties of Cromarty and Ross. It forms a noble harbour, 18 miles long, running south-west, 3 to 5 miles broad, and 5 to 35 fathoms deep. It receives several rivers, the Conan, entering at its upper end, being 35 miles long. The entrance to C. F. is by a strait between two high wooded cliffs or headlands, the North and South Sutors of Cromarty, only 1½ mile across, with 12 to 30 fathoms of water, and with the Three Kings Reef, about half a mile off land. Near the Firth are the towns of Dingwall, Invergordon, and Cromarty. The largest fleet could ride safely sheltered in this fine sheet of water. In the old red sandstone, near the mouth of the Firth, Hugh Miller discovered the fossil fishes *Pterychthys*, *Osteolepis*, &c.

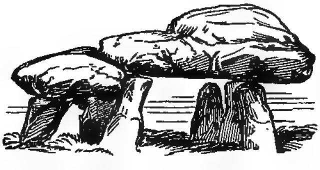
**CRO'MARTYSHIRE**, a county of the north of Scotland, intimately connected, geographically and politically, with Ross-shire, and consisting of ten detached portions in the interior, and along the northern borders of Ross-shire. Area, 344 square miles, or under an eighth of Ross-shire. See ROSS AND CROMARTY SHIRES.

**CRO'MDALE**, a village on the east bank of the Spey, Inverness-shire, at which was fought the battle of C., May 1, 1690, between a small remnant of the adherents of the house of Stuart, who kept in arms after the death of Viscount Dundee, and the forces of King William, in which the latter were victorious. This encounter has been rendered famous by a song, entitled *The Haughs of Cromdale*, which, however, presents a lamentable confusion of historical events.

**CRO'MER**, a seaport and watering-place on the north coast of Norfolk, 21 miles north of Norwich. It stands on the top of one of the highest cliffs of the coast. Nearly all the old town, called Shipden, with one of the churches, was swept away by the sea about the year 1500. The sea is still gaining on the land, and some houses have been destroyed by it within present memory. In 1825, some cliffs, 200 feet high, fell into the sea. Seamen call C. Bay the Devil's Throat, from its dangers to navigation. Vessels have to load and unload on the open beach. C. has fisheries for crabs, lobsters, herrings, and mackerel. Pop. of parish, 1366.

**CRO'MLECH**, the name which has come to be generally used among archæologists for a rude structure of two or more unhewn stones, placed erect in the earth, and supporting a larger stone, also unhewn, the whole forming an imperfect kind of chamber or enclosure. The etymology of the word C. does not seem to be ascertained, but it is believed to be Celtic, and to signify the 'bent,' 'bowing,' 'inclined,' or 'suspended' stone. When or where the term was first applied, seems also to be uncertain, but it would appear to have originated among antiquaries. The monuments which it has been employed to designate are known among the common people by other names, such as 'the giant's grave,' 'the giant's bed,' 'the giant's quoit,' 'the fairies' table,' 'the devil's table,' 'the raised stone,' 'the old wife's lift,' 'the hag's bed,' and the like. The name *dolmen*, a Celtic word, which is said to signify a stone table, is given to them in France. See DOLMEN; see, also, SEPULCHRAL MOUNDS.

Cromlechs are found in England, Wales, Scotland, Ireland, the Channel Isles, France, Spain, Germany, Denmark, and some other countries of Europe; in Hindustan and elsewhere in Asia; and in America. They are generally without any enclosure; but occasionally they are fenced round with a ring of unhewn stones. In a good many instances, cromlechs have been discovered in the heart of earthen mounds or barrows. In such cases, the rude chamber or enclosure of the C. is found to contain sepulchral remains, such as skeletons or urns, together with weapons or ornaments generally of stone or bone, fragments of pottery, and bones of animals. Similar remains have been found in the chambers of cromlechs not known to have been at any time covered by barrows. These facts have led modern archæologists to believe that the C. was a sepulchral monument. The theory of the older antiquaries,



Cromlech.

that the C. was a druidical altar, is without any foundation in what has been recorded of the druidical worship by trustworthy writers. In Flanders, a C. containing Roman remains has been dug up in the middle of a Roman cemetery; and in a C. found under a barrow in Derbyshire, a skeleton and fragments of urns were discovered, along with Roman coins of the emperors Claudius Gothicus (268—270), Constantine the Great (306—337), Constantine the Younger (337—340), and Valentinian I. (364—375).

Among the more remarkable cromlechs in England are Kit's Coty House in Kent, Wayland Smith's Cave in Berkshire (commemorated by Sir Walter Scott in *Kenilworth*), and Chun Quoit in Cornwall. The weight of the flat stone in this last C. is estimated at about twenty tons. In the Marquis of Anglesey's park at Plas Newydd in Wales there are two cromlechs close beside each other: in the larger, five erect stones support a flat stone about twelve feet long, ten feet wide, and from three feet and a half to four feet and a half thick. Cromlechs are comparatively rare in Scotland. The best among the well-ascertained examples is perhaps that called 'The Auld Wife's Lift,' near Craigmeddan Castle, in the parish of Baldernock in Stirlingshire: the recumbent stone, a mass of basalt, is eighteen feet long, eleven feet wide, and six or seven feet thick, and the two stones which support it are of nearly the same size. It may be doubted if the partial elevation of the 'Witch's Stone' at Bonnington Mains, near Ratho, in the county of Edinburgh, has not been produced by natural causes. Among the Irish cromlechs, one of the most striking is that of Kilternan, about six miles from Dublin: the recumbent stone, which rests upon six blocks, is twenty-three feet and a half long, seventeen feet wide, and six feet and a half thick. A cromlech called 'The Broadstone,' in the county of Antrim, is surrounded by a circle of standing stones, or erect unhewn pillars. A cromlech in the Phœnix Park, Dublin, was discovered in 1838 in removing a large barrow: specimens of the sepulchral remains found in it are shewn in the Museum of the Royal Irish Academy.

**CROMPTON**, SAMUEL, whose invention of the spinning-mule entitles him to rank as one of mankind's greatest benefactors, was born at Firwood, Bolton, Lancashire, December 3, 1753. Bolton, in those days, was nearly inaccessible, and so bleak and barren that agriculture was not followed further than to supply the wants of the population. All the farmers had looms in their houses, and their families were occupied in spinning and weaving. C.'s father, who was a small farmer, lived at the Hall-in-th'-Wood, a picturesque old mansion near Bolton. He died at an early age, leaving a wife, and a son (the subject of our memoir), and two daughters. Like his father, C. was brought up to the loom and the farm. His mother, a woman of great energy, perseverance, and stern independence, struggled hard to give him and her daughters the best education the district afforded. When he was old enough, he assisted her in the farm, and wove; going to Bolton at night to complete his education in mathematics, &c. At the age of 21, he was so much annoyed at the difficulties in getting yarn to weave, that he set to work to invent a spinning-machine which should produce better yarn than Hargreaves', one of which his mother possessed. For five years, he laboured to realise his idea, sitting up late at night to overcome the successive difficulties, and resuming his labour for daily bread early in the morning. At length he succeeded in framing a machine which produced yarn of such astonishing fineness, that the house was beset by persons eager to know how such wonderful and desirable yarn could be made. He was rendered miserable. All kinds of devices were tried to gain admission; even ladders were placed against his windows. His machine was such that if a mechanic saw it, he could carry away the leading features of it. He could not leave the house for fear of his discovery being stolen from him. He had spent every farthing he had in the world upon its completion; he had no funds wherewith to have obtained a patent, and it is doubtful whether a patent would have altered his fate. When he was thus almost driven to desperation, one of the manufacturers went to him and persuaded him to disclose the invention to the trade, under the promise of a liberal subscription. Inexperienced in the world, he agreed to this. The machine was exhibited, but all that he got was about £60. This money was not paid to him at the time, but he had to travel for many miles round the country to collect it. Some refused to pay, though he shewed them their signatures. He set manfully to work with his machine, determined to make the best he could of his ill-luck. In the course of time, he saved money enough to begin manufacturing on a small scale, but not till his rivals had nearly 20 years' start of him in the business. Then his wife died, leaving him a large family. Efforts were made to obtain for him a national reward. Five thousand pounds was all he obtained, and he returned to Bolton almost broken-hearted. Misfortune upon misfortune overtook him till he died, June 26, 1827. Some idea may be formed of the vast services he has rendered to the world, and especially to his native land, by the fact, that his is by far the most used of all spinning-machines. In 1811, the number of spindles on C.'s principle was 4,600,000, while there were only 310,500 of Arkwright's, and 155,880 of Hargreaves'. At the present time, it is conjectured that there are 25,000,000 of C.'s spindles at work. Yet this great genius was never noticed by his king, and the appointments under the Factory Acts to which his descendants might have aspired, have been filled by the relatives or nominees of her Majesty's ministers. For a complete account of this great improver of the cotton manufacture, we refer to the *Life of Crompton*, by Mr G. French, 1860.

**CROMWELL**, OLIVER, was born at Huntingdon, April 25, 1599. His father was the younger son of Sir Henry Cromwell of Hinchinbrook, and a substantial country gentleman, not likely to have been a brewer, as some of Oliver's earlier biographers assert. By his mother, genealogists trace Oliver's descent from the royal House of Stuart. Of the boy Cromwell's early life, little or nothing is actually known. What is clearly ascertained is, that after having been at school in Huntingdon, he went to Cambridge, and entered himself of Sidney-Sussex College, April 23, 1616. He had but short time for study here, his father dying in the June of the year following, when he returned home to take the management of his father's affairs. The stories of his wild life about this time appear to have no better foundation than the calumnies of royalists. In August 1620, C. married the daughter of Sir James Bourchier, a gentleman of landed property in Essex, who had also a residence in London. This fact is pretty conclusive as to C.'s social position being much above what his enemies have described it. C. now became intimately associated with the Puritan party, among whom he was soon distinguished alike for his earnestness and sagacity. In 1628, having been elected by the borough of Huntingdon, C. made his first appearance in parliament. He had but time to make a short blunt speech about the encouragement of the 'preaching of flat popery at Paul's Cross' by the Bishop of Winchester, when the infatuated king unceremoniously despatched him and his fellow-commoners to their homes. C. returned to the fen-country, not much impressed in favour of king-craft by his visit to London; and for the next eleven years devoted himself assiduously to the pursuit of farming by the Black Ouse river and the Cam, first at Huntingdon, then at St Ives, and finally at Ely—making himself famous, not by political agitation, but by an effectual resistance to certain unjust schemes of the king in council for the drainage of the Fens. In 1640, he was sent to parliament as member for the town of Cambridge. His appearance at this time was by no means prepossessing. Sir Philip Warwick describes him in 'a plain cloth suit, which seemed to have been made by an ill country tailor; his linen was plain, and not very clean; and I remember a speck or two of blood upon his little band, which was not much larger than his collar. His hat was without a hat-band; his stature was of a good size; his sword stuck close to his side; his countenance swollen and reddish; his voice sharp and untunable; and his eloquence full of fervour;' and courtly Sir Philip adds: 'It lessened much my reverence unto that great council, for this gentleman was very much hearkened unto.' When all hope of reconciliation between king and parliament failed, through the perfidy of the former, C. was among the first to offer of his substance to aid in defence of the state. In July 1642, he moved in parliament for permission to raise two companies of volunteers in Cambridge, having been careful to supply the necessary arms beforehand at his own cost. In the following month, C. seized the magazine in Cambridgeshire, and prevented the royalists from carrying off the plate (valued at £20,000) in the university there. As captain of a troop of horse, C. exhibited astonishing military genius; and against the men trained by himself—'Cromwell's Ironsides'—the battle-shock of the fiery Rupert, which at the beginning of the parliamentary struggle none else could withstand, spent itself in vain. Soon promoted to the rank of colonel, and then to that of lieutenant-general, C., in the fight of Winceby, on the bloody field of Marston (July 2, 1644), and in the second battle of Newbury (October 27, 1644), bore himself with distinguished bravery; but owing to the backwardness of his superiors, the results of these victories to the parliamentary cause were not so great as they might reasonably have been. C. thus complained in parliament of the backwardness of his superiors, Essex and Manchester: 'I do conceive if the army be not put into another method, and the war more vigorously prosecuted, the people can bear the war no longer, and will enforce you to a dishonourable peace.' Hereupon, the 'Self-denying Ordinance'—an act excluding members of the houses of parliament from holding command in the army—was passed; but C.'s services were considered of such importance to the common weal, that they were exceptionally retained. Of the new model army, Fairfax was appointed general, C. serving under him as lieutenant-general of the horse, and in this capacity he commanded the right wing of the parliamentary army at Naseby, June 1645, and acquitted himself so well there, that the king's forces were utterly ruined. The royalists in the west were now speedily reduced. Bristol was stormed; everywhere the royal cause was failing; and Charles himself, reduced to the last extemity, in May 1646 escaped from Oxford in disguise, and threw himself into the arms of the Scotch army at Newark (May 5, 1646), by whom he was shortly given up to the parliamentary commissioners. The source of the strife now fairly within their grasp, the parliament and the army, in the former of which the Presbyterian, and in the latter the Independent, element predominated, became jealous of each other's power. With his usual sagacity, C. perceived that the advantage would lie with that party who held possession of the king's person, and with ready decision he had him removed from the hands of the commissioners into those of the army, June 1647. Some of the leading Presbyterians were now turned out of parliament by the army, and Independency, with C. at its head, was gradually obtaining the ascendency. The king still remained with the army, and with his usual duplicity, negotiated with both parties, not without hope that out of their mutual dissensions might arise advantage to himself. On the 11th November 1647, the king made his escape from Hampton Court. Two days after, he was in custody of Colonel Hammond in the Isle of Wight. At this time the country was in a critical condition. The Welsh had risen in insurrection, a Scotch army was bearing down from the north with hostile intent, and Rupert, to whom seventeen English ships had deserted, was threatening a descent from Holland, not to speak of the rampant royalism of Ireland. Prompt measures alone could prevent anarchy and inextricable confusion, and C. was not afraid to employ them. Pembroke had to surrender, and at Preston Moor the Scotch were utterly defeated. On the return of the army to London, the Presbyterians, who were still blindly temporising with the king, to the number of more than 100, were driven out (December 1648) by the process known in history as 'Pride's Purge.' Then that which C. thought could alone end the strife, happened. In January 1649, the king was tried, condemned, and executed. The abolition of the House of Lords followed speedily, and C. became a prominent member of the new Council of State; and in the army, though still only lieutenant-general, he had really much more influence than the commander-in-chief. The royalists being still strong and rebellious in Ireland, C. went thither in August, with the title of lord-lieutenant, and commander-in-chief of the army there; and ere nine months had passed, he had subdued the country so far, that it might be safely left to the keeping of his son-in-law, Ireton. C.'s measures for crushing the Irish rebels were indeed severe, and even sanguinary, but, nevertheless, peace and prosperity followed in a degree unknown before in the history of that unhappy country. Affairs in Scotland now claimed C.'s attention. Scotch commissioners had been negotiating with Charles II. at Breda, had urged him to come among them and take the Covenant, and they would crown him king over them at least, and do what force of arms could do to make him king of England also. Charles arrived in the north of Scotland on the 23d June 1650; three days thereafter, Cromwell—Presbyterian Fairfax having refused to fight against the Presbyterian Scotch—was appointed commander-in-chief of all the parliament forces. On the 15th of July, Charles Stuart had signed the Covenant, and was fully accepted as king. On the 3d September following, C. routed the Scotch army at Dunbar. Charles, with what force remained, and other accessions, afterwards marched southward, and had penetrated to Worcester, when C. came up with him, and utterly overthrew the royalists on the anniversary of the battle of Dunbar. This battle placed C. avowedly at the head of public affairs in England, and to write his biography from this time until his death, would be to write the history of the Commonwealth. The Long Parliament had now degenerated into the Rump—had become, in truth, an oligarchy, given to long and useless discussions about mere technicalities—intolerable to the country alike for the extraordinary power it possessed, and for the weak, pusillanimous way in which it exercised it. C., therefore, dissolved the Rump, 20th April 1653, and henceforth he alone was ruler in England. He immediately summoned a parliament of 140 persons, 138 of whom assembled on the 4th July, but he found it necessary to dissolve it on the 12th December; its one great work having been the legal investiture of C. with the supreme power and the title of Lord Protector, a position upon which the principal foreign powers hastened to congratulate him. C. now acted in a very arbitrary manner, so far as his parliaments were concerned, calling them and dismissing them at pleasure; but his home policy, notwithstanding, was just and liberal towards the mass of the people, and conducive to the prosperity of the country; while his foreign policy was such as to secure England a position among nations more commanding than any she had ever occupied before. Under C.'s rule, swift retribution followed any indignity or injury to Englishmen, no matter by whom or where perpetrated; and religious persecutors on the continent, in terror, stayed their bloody swords on the stern summons of the Lord Protector. He died September 3, 1658, the anniversary of some of his most important victories. C. was buried in Westminster Abbey; but on the 30th January 1661 (the anniversary of the death of Charles I.) his grave, along with those of Ireton and Bradshaw, were broken open, the coffins dragged to Tyburn, where the mouldering bodies were hanged, and then thrown into a deep hole under the gallows, while their heads were set upon poles on the top of Westminster Hall. Such was the sacrilegious brutality of the king and clergy (for the deed was done by their authority) towards England's greatest ruler. It was long a fashion with historians, content to rely upon the calumnies and falsehoods of royalist writers, to represent C. as a monster of cruelty and hypocrisy—a man with a natural taste for blood, who made use of religious phraseology merely to subserve his own ambitious ends; but after the researches of Carlyle and Guizot, the eloquence of Macaulay, and the clear statement and sound sense of Forster, such a view can no longer be upheld. C.'s religion was no mere profession, it was the very essence of the man; by nature, he was not a blood-shedder, and when necessity demanded the grim exercise of the sword, he unsheathed it with reluctance. Never was a religious man less of a bigot; he would not, in so far as his iron will could effect his purpose, permit any one to be persecuted for religious opinions. He delivered Biddle, the founder of English Unitarianism, out of the hands of the Westminster divines. He would have even given the despised and persecuted Jews the right hand of citizenship. He grasped power, and dispensed with the formality of parliaments, only because he sought to promote, in the speediest possible manner, the prosperity, happiness, and glory of his native land.

**CROMWELL**, Richard, son of Oliver Cromwell, Lord Protector of England, was born at Huntingdon, October 4, 1626. In early life, he was noted chiefly for his indolence and love of pleasure, qualities that united him more closely to the cavaliers than to the party of earnest men of which his father was the chief. When Oliver attained the dignity of Lord Protector, he called his son from the obscurity of a country-house, and his field-sports, to have him elected for the counties of Monmouth and Southampton, appointed him First Lord of Trade and Navigation, and made him Chancellor of Oxford. In none of these capacities did Richard C. exhibit any aptitude; and his failure as Protector, to which high office (being the eldest surviving son) he succeeded, on the death of his father, September 1658—was still more conspicuous. With a mediocre intellect, and no energy, hardly a friend in the army, and the first parliament he called against him, the result could not be otherwise than it was—his demission (April 1659)—little more than seven months after he had assumed the sceptre of the Commonwealth. He retired to Hampton Court, from whence parliamentary stinginess and pressing creditors soon drove him to the continent, where he resided for a considerable period. At length, returning to England, he had a house provided for him at Cheshunt, near London, where he resided in strict privacy until his death, in 1712.

**CROMWELL**, Thomas, an eminent English statesman and ecclesiastical reformer, of the reign of Henry VIII., was born near London in very humble circumstances, his father being a blacksmith, about 1490. After receiving but a very meagre education, he went to the continent, and became clerk in a factory at Antwerp, where he devoted his spare time to the acquisition of languages, in which he became very proficient. In 1510, he went into Italy, where he appears to have resided until about 1517, when he returned to England; and, after some time, was received into the household of Wolsey. That prelate, speedily recognising his abilities, made him his solicitor and chief agent in all important business. As a member of the House of Commons, C. warmly and successfully defended the fallen minister, his master, against the bill of impeachment—proof enough that he was not the heartlessly ambitious man that his enemies have represented him. Henry, admiring his chivalry, and appreciating his talent, made him his own secretary; knighted him in 1531, and made him a privy-councillor. Honours rapidly flowed in upon him; partly in consequence, it is said, of his having suggested to Henry the desirableness of throwing off the papal yoke altogether—an idea which suited well with the king's impetuous nature—but chiefly, no doubt, on account of his great abilities. In 1534, he had become chief Secretary of State, and Master of the Rolls; in the following year, he was made Visitor-general of English Monasteries—which he afterwards suppressed in such fashion as to obtain for himself the designation of *Malleus Monachorum*—and keeper of the privy seal in 1536. In 1539—to pass over a variety of minor tokens of royal approbation—he had risen to be Earl of Essex—having had some thirty monastic manors and estates given to him to keep up the dignity of his title—and Lord Chamberlain of England. C. took the leading part in establishing the doctrines of the Reformation, though he seems to have done so less on religious than on political grounds. The destruction of the pope's authority, and the establishment of the supremacy of the king in England, were what he laboured to effect; and with this view, he promulgated the articles of the new faith, had English Bibles placed in the churches, and the youth of the nation taught the Creed, the Ten Commandments, and the Lord's Prayer; and ordered the removal of all images from the altar. In this matter of ecclesiastical polity, he has, says Mr Froude, in the third volume of his *History of England*, 'left the print of his individual genius stamped indelibly, while the metal was at white heat, into the constitution of the country. Wave after wave has rolled over his work. Romanism flowed back over it under Mary; Puritanism, under another even grander, Cromwell, overwhelmed it. But Romanism ebbed again, and Puritanism is dead, and the polity of the Church of England remains as it was left by its creator.' In all that concerned the state, in its vastest and most complicated foreign relations, as well in the smallest matters of sanitary reform at home, C. took an active personal interest. But the stern, almost savage manner in which, in the carrying out of his policy, he disposed of all who opposed him, led to many and loud complaints, which damaged somewhat his popularity with the king. In order to retrieve his lost ground, he was zealous in promoting the marriage of Henry with Anne of Cleves, from whom, on account of her known Lutheran tendencies, he expected strong support. The success of his efforts in this matter proved the utter ruin of C., for the king, early conceiving a strong aversion to his unlovely queen, extended that dislike to the minister who had so strenuously promoted the marriage. Complaints against C. poured in thicker and faster, and the royal ear was not unwilling to listen now. Charges of malversation and treason were made, and he was arrested and thrown into prison (10th June 1540); a bill of attainder was quickly drawn up, and passed the two Houses of Parliament with little difficulty; and on the 28th July following, C. laid his head on the block on Tower Hill. A statesman of undoubted genius, he saw what was best for his country, and did it—not certainly in a way commending itself to the judgment of the present time—but, perhaps, among the best and only sure modes that could be devised in his age. He was undoubtedly unscrupulous, and very haughty towards the high; but the poor and weak found him easily accessible, and, when wronged, a warm defender; and though he was rapacious, the hungry had, nevertheless, to thank his generosity for many a meal.

**CRO'NSTADT** (Hungarian, *Brasso*), a town of Transylvania, romantically situated amid the East Carpathians, at an elevation of 2000 feet above the sea. Lat. 45° 36′ N., long. 25° 33′ E. It consists of an inner town, surrounded by walls, and of three pretty extensive suburbs, the population being about 30,000. The centre town, which dates from the 13th c., is well and regularly built, and contains some handsome buildings, the chief of which is a Gothic Protestant church, built in the 14th century. This part is almost exclusively inhabited by Saxons. The suburbs, surrounded with gardens and orchards, with here and there the hoary ruins of some old castle, or the sloping roofs of some modern villa, rising above the trees, have a pleasant and picturesque appearance. The suburbs are chiefly occupied by Wallachs and Magyars. Linens, cottons, coarse woollens, hosiery, paper, &c., are manufactured here in considerable quantities. C. was the first town in Transylvania where a printing-press was established, and the first issues from it were the *Augsburg Confession*, and the works of Luther.

**CRONSTADT,** a strongly fortified seaport, about 20 miles west of St Petersburg, on a narrow calcareous island of about five miles in length, at the narrowest part of the Gulf of Finland, and over against the mouth of the Neva. Lat. (of cathedral) 59° 59′ 46″ N., long. 29° 46′ 38″ E. C. is at once the greatest naval station and the most flourishing commercial port of Russia. It was founded by Peter the Great in 1710, the island having been taken from the Swedes by him in 1703. Its fortifications, which protect the approach to St Petersburg, have been an object of great attention to the Russian government. The batteries are very numerous, defending every part of the channel by which vessels can enter. They are all built of granite, and armed with the heaviest ordnance. The place, indeed, was considered by the British admiral who reconnoitred it during the Russian war of 1854—1855, so impregnable, that it would have been utter madness to make any attempt upon it. C., which is the seat of the Russian Admiralty, has three harbours: the east, intended for vessels of war, and capable of accommodating 30 ships of the line; the middle harbour, where vessels are fitted up and repaired, and which is connected with the former by a broad canal; and the west or Merchant's Harbour, for the merchant-shipping, with capacity for 1000 vessels; all are admirably defended. Not only the trade of St Petersburg is conducted through this port, but that of a great part of the interior of Russia, which is connected with it by navigable rivers and canals. C. contains many well-built houses; the population in winter, when the place is almost deserted, amounts, with the garrison, to about 10,000, but in summer it is augmented to 40,000 or 50,000.

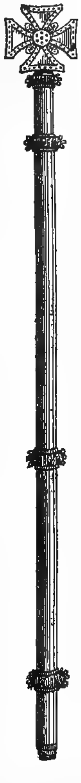
**CROOK,** belonging to musical instruments, such as the French-horn or trumpet, is a circular tube, which fits into the end of the instrument next the mouthpiece, for the purpose of making the pitch of the instrument suit the key of the music; the notes of the parts for these instruments being always written in the natural key of C, with the name of the key of the piece marked in letters.

**CROOK,** SHEPHERD'S. See PASTORAL STAFF.

**CROOKED ISLAND,** one of the Bahamas, contains 160 square miles, and about 1200 inhabitants. It lies to the south-east of Long Island, of which the north-west extremity forms nearly the middle point of the chain. In common with some others of the group, it is valuable chiefly for its salt. In the exportation of this article, C. I. appears to stand third in order, its share having, in 1851, amounted to 112,878 bushels. The Bahama Salines are all the more important from the fact, that, for the curing of fish, salt obtained by solar evaporation is preferred to that procured from mines.

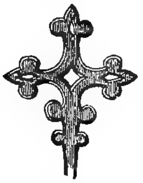
**CROP,** or **OUT-CROP,** is the edge of a stratum where it rises to the surface, or, as the miners say, comes out to the day. The line of out-crop of a bed along a level surface is called its *strike;* it is described by its relation to one or other of the points of the compass.

**CRO'SIER,** a staff surmounted by a cross, which is carried before a bishop on solemn occasions. It is about five feet long, is generally made of tin, and is hollow. Crosiers are generally gilt, and are often richly ornamented. The C. differs entirely from the pastoral staff, with which it is often nevertheless confounded—the latter having a circular head, in the form of a crook. Subjoined is an illustration of Archbishop Warham's crosier (1520) from Canterbury Cathedral.



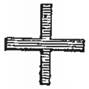
**CROSS.** The C. was a common instrument of capital punishment among the ancients; and the death of the C. was esteemed so dishonourable that only slaves and malefactors of the lowest class were subjected to it by the Romans. It was customary to proclaim the name and offence of the person crucified, or to affix a tablet (*album*) to the C., on which they were inscribed. Malefactors were sometimes fastened on a simple upright stake, and so left to die, or they were impaled upon it, and to this upright stake the Latin name *crux* was originally and more strictly applicable; but very generally a cross-piece (*patibulum*) was added to the stake, to which the arms of the criminal were tied, or to which his hands were nailed. When the cross-piece was fastened at right angles below the summit of the upright stake, the C. was called *crux immissa;* when the cross-piece was fastened at right angles across the top of the upright stake, the C. was *crux commissa;* and when it was formed of two beams crossing one another obliquely, it was *crux decussata.* The C. was erected without the gates of towns, but in places of frequent resort. The person crucified often lived for days upon the cross. The death of Christ by crucifixion led Christians to regard the C. with peculiar feelings of reverence, and to make use of the sign of the C. as a holy and distinguishing sign. The custom of *crossing*, in honour and commemoration of Christ, can be traced back to the 3d century. The Emperor Constantine, after obtaining the victory over Maxentius, through the influence—as he believed—of the sign of the C., caused crosses to be set up in public places and upon public buildings; and the veneration of the C. increased, particularly after the *Invention of the C.*, or finding of the alleged true C. of Christ in Jerusalem by the Empress Helena. See CROSS, INVENTION OF. The desire for relics was gratified, and numberless portions of the true C. were given away, without its being diminished. Iconoclasts and others contended in vain against the prevalent worship of the C.; and the *crucifix* (q. v.), a C. with an image of the Saviour affixed to it, was honoured more than any other image. The sign of the C. is made not only by Roman Catholics, but by the members of the Eastern churches also; there are, however, distinctive differences in the manner in which it is made. It is admitted by the Lutherans as a commemorative sign of the atoning death of Christ, but by many Protestants is rejected as a human invention in worship, and as tending to superstition. It was very generally used during the middle ages, and still is among the less enlightened peasantry in some Roman Catholic countries as a sort of charm, or as affording some security, like an amulet, against all evil, and particularly against evil spirits and witchcraft.

It appears that the sign of the C. was in use as an emblem, having certain religious and mystic meanings attached to it, long before the Christian era; and the Spanish conquerors were astonished to find it an object of religious veneration among the natives of Central and South America. Be this as it may, it was early adopted as a symbol by Christians, with express reference to the central fact of their religion, and it has been extensively used as an ornament in Christian architecture, and in the ground-plan of churches (q. v.).

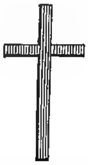


The C. of the Resurrection is opposed to the C. of the Passion, by ecclesiastical writers. It is a lance, headed by a C. instead of a pike, and carrying a banner upon which a C. is depicted. It is the C. held by the paschal lamb, and carried at the head of religious processions. The large C. always placed over the entrance of the main chancel of a church, was called the *rood*, or *holy rood.* A representation is here given of the top of one of these large ornamental crosses.

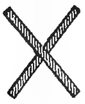
The forms given to crosses in art are endless; but the two leading types are the Latin C., or *crux immissa*, supposed to be that on which Christ suffered, and the Greek C., both of which are subject to many fantastic variations. The Greek C. forms the well-known C. of St George, which, adopted from the legends of that hero, was the national ensign of the English previous to the union with Scotland. The C. of St Andrew differed entirely in form from the Latin or Greek cross. This C., or *crux decussata*, consisted of two shafts of equal length crossed diagonally at the middle, as in the annexed cut. According to the legend, this was the form of C. on which St Andrew, the national saint of Scotland, suffered martyrdom. As the Scottish ensign, it is now blended with the C. of St George in the Union Jack.



Greek Cross.

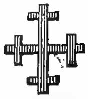


Latin Cross.

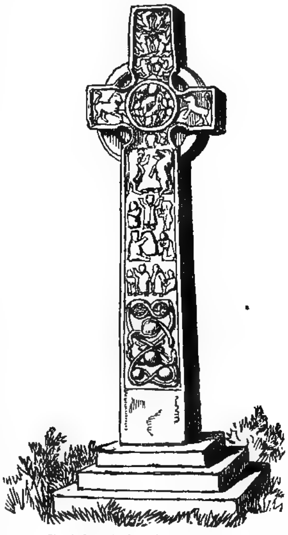


St Andrew's Cross.

Many very beautiful crosses exist in England, upon the points of gables of churches, on gravestones, and in other situations, as also in heraldry. Among these, the C. most commonly seen is called the *C. crosslet.* In this figure, as seen in the annexed cut, the extremities are intersected, so as to make several small crosses. When employed in ecclesiastical architecture, the figure is usually carved in a florid or highly decorative style. When the C. crosslet is pointed at the lower extremity instead of being crossed, it is in heraldry said to be fitched, or *fitchée.* It is of frequent use in blazon.

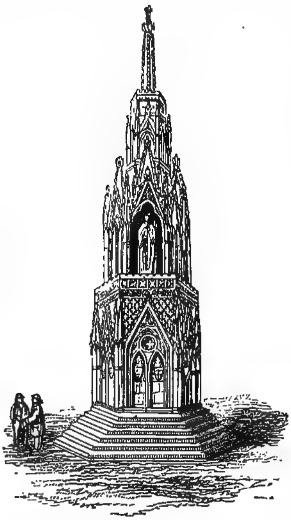


*Sanctuary, Boundary,* or *Monumental Crosses,* as they are called, consist of an upright flat pillar or obelisk, covered with sculptured devices, and set in a socket level with the ground. Occasionally, they appear to have marked boundaries, but more frequently were monuments over the graves of heroes, kings, bishops, &c. In some instances, they probably marked the verge of a sanctuary. The older of these crosses are said to be Scandinavian or Danish, and such are known as *Runic Crosses*, the term *rune* signifying a superstitious invocation. We are told that the island of Iona at one time possessed 360 crosses, but all are now destroyed or dispersed except one, called St Martin's Cross, standing in the grounds of the cathedral. It is a column of compact mica schist, 14 feet high, 18 inches broad, and 6 inches thick, and is fixed in a pedestal formed out of a massive block of red granite, about 3 feet high. In connection with certain ancient religious houses in Ireland, there were some very fine crosses of this kind; the most gigantic and impressive which still exists being that of St Luke's in the county of Louth.



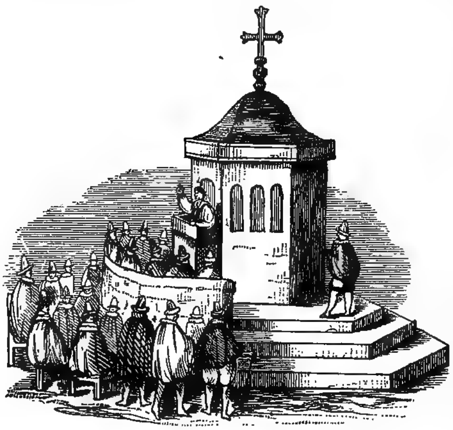
St Martin's Cross, Iona.

*Memorial Crosses* are those which were erected in memory of some beloved object, or in commemoration of some event of local importance. In England, there are some superb crosses of this kind; they are popularly called *Norman Crosses.* This species of C. resembled a Gothic turret set on the ground, or on a base of a few steps, and was decorated with niches for figures and pinnacles. The best known examples are those erected by Edward I. (1290) in memory of his queen, Eleanor; being placed on the spots where the body rested in its funereal progress to Westminster. The crosses at Waltham, Cheapside, and Charing were of the number. Those at Cheapside and at Charing are destroyed, but the C. at Waltham, though now much decayed, remains as a testimonial of the affection and piety of the greatest of the Plantagenets. We present a sketch of this beautiful Norman cross, as restored.



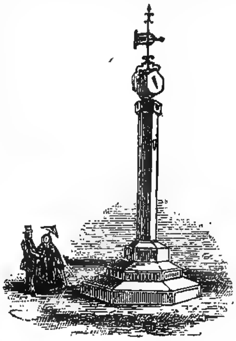
Waltham Cross, restored.

*Town* or *Market Crosses* were erected as stands to preach from, or in commemoration of events regarding which it was deemed proper to evoke pious feelings. As these structures were incorporated with or surmounted by a crucifix, the term *cross* was so indelibly associated with them that it survived the religious character of the fabrics. 'The general intent of market-crosses was to excite public homage to the religion of Christ crucified, and to inspire men with a sense of morality and piety amidst the ordinary transactions of life.'—Milner's *History of Winchester.* The earliest examples of this kind consisted, probably, of tall crucifixes of wood, such as are still seen by the waysides in some continental countries. Afterwards, stone shafts would be substituted; and according to the increase of market revenues, or progress of taste, these town crosses assumed that imposing character which they latterly possessed. Of the larger ornamental crosses of this kind, there are some striking specimens in England. We may refer to that at Cheddar in Somersetshire, and that at Malmesbury in Wiltshire; both are open vaulted structures, with a commodious space beneath, as a refuge for poor market-folks during rain, and surmounted with a kind of Gothic turret. At Chichester, Bristol, and Winchester, the market-crosses, while similar in form, are of a higher architectural quality. See Britton's *Architectural Antiquities.* Adjoining St Paul's in London, stood Paul's C., a structure which we read of as early as 1259, in the reign of Henry III. It was essentially a town-preaching C., and is associated with some interesting occurrences in history. Before this C. the unfortunate Jane Shore was forced to do penance in the reign of Richard III., to whose malice she was made a victim. This event was followed by Dr Shawe's infamous sermon, attempting to bastardise the children of Edward, and eulogising Richard, who was present on the occasion. In front of this C. sat Cardinal Wolsey, to hear fulminations against Luther; and about ten years later, by order of Henry VIII., preachers here delivered sermons in favour of the Reformation. At this C., Queen Elizabeth attended to hear a thanksgiving sermon for the defeat of the Spanish Armada. Here, sermons continued to be delivered until 1643, when, with other so-called relics of popery, the C. incurred the displeasure of the Puritans, and was demolished by order of parliament. Whatever was the original form of Paul's C., it was in later times a plain pulpit-like fabric of wood, covered with lead, and, as seen by the adjoining cut, was provided with seats for an audience. This inoffensive and really useful preaching C., which we could wish had been spared, stood on the north side of the church, a little to the east of Cannon Alley.



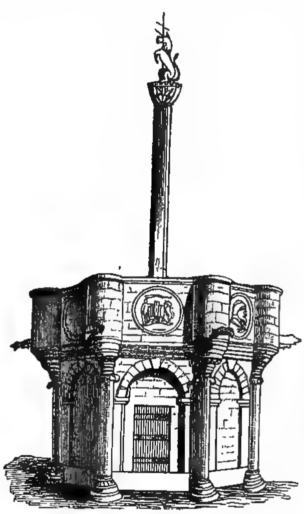
St Paul's Cross.

Scotland offers no specimens of memorial or Norman crosses, though, perhaps, we should make an exception in favour of the Scott Monument, at Edinburgh, which is essentially a Norman C. of a gigantic order. See SCOTT, SIR WALTER. As regards the market-crosses of Scotland, they never attained to that elaborately ornate character which distinguishes such crosses as those of Chichester and Winchester. Yet the Scottish town-crosses had some distinguishing features. The more simple kind consisted of a shaft of stone, generally octangular in shape, and 12 or more feet in height. At top was an ornamental capital, which bore a dial and vane, or the figure of a unicorn. The shaft sprang from the top of a graduated flight of circular or octangular steps. A specimen of this species of C. is seen in the market-place of Melrose. Another specimen, renovated and set in the quadrangle of the Chambers Institution, Peebles, is shewn in the annexed cut. The grander market C. consisted of a tall stone shaft, such as just described, but instead of steps, it sprang from the centre of an imposing sub-structure. This structure was circular, hexagonal, or octagonal, and from 10 to 16 feet high. The top formed a platform, which was surrounded with an ornamented stone



Peebles Cross.

parapet, and was reached by a stair inside. The sides of the building were decorated with pilasters, and bore various heraldic and other devices. Such were the crosses of Edinburgh, and such is the renovated C. of Aberdeen, the sides of which, however, are open. Losing their religious character, the Scottish market-crosses were employed for royal and civic proclamations, and as places where certain judicial writs were executed. The general removal of these ancient and interesting structures has been often matter of lamentation. The oldest C. of Edinburgh, which was the scene of a number of incidents connected with Scottish history, stood in the centre of the High Street, nearly opposite the entrance to the Parliament Square. It was removed in 1617, to make way for a royal pageant, the procession of James VI., on his first visit to Edinburgh after his removal to England. A new market-C. was then erected a short way further down the street, on the south side. We give a sketch of this C., which consisted of an octangular sub-structure 16 feet across, with a handsome stone shaft of about 20 feet in height; its removal in 1756, by the civic authorities, is indignantly referred to by Scott in his poem of *Marmion.* Since its removal, royal proclamations, &c., are made on the site, which for these and other purposes is technically the market-C. of Edinburgh. With a better appreciation of objects of archæological interest than prevailed in the 18th c., the re-erection of the C. has been recently agitated. W. C.



Edinburgh Market-cross.

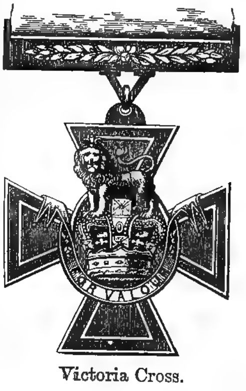
**CROSS**, in Heraldry. If we assume the art of blazon to have originated in connection with the Crusades, it will not surprise us to find the symbol of the Christian faith so frequently introduced into the escutcheons of ancient and noble families everywhere in Europe. It is one of the honourable ordinaries, and, indeed, from its sacred character, is esteemed by heralds as the most honourable charge. Its form varies so much that Ménestrier counts 42 crosses; La Colombière, 72; and Guillim, 39. Most of the architectural crosses occur in heraldry, along with many others.

**CROSS**, Invention of the, the name given in the Roman Catholic Church to a festival which commemorates the finding of the alleged true C. of our Saviour, and which is celebrated on the 3d of May. The Empress Helena, the mother of Constantine the Great, out of a desire of visiting the holy places, undertook a journey to Palestine in 326, though she was then near eighty years of age; and being animated with a great desire of finding the C. on which our Saviour suffered, she was so well directed, it is said, in the search which she instituted, that the C. was found, and with it the crosses of the two thieves; but the title being found separate from the C., a miracle readily determined which was the proper object of reverence. An order of friars, founded in honour of the Invention of the Cross, and carrying in their hand a staff, on the top of which was a C., received the name of *Croisiers* (Fr. *croix*, cross), corrupted into *Crouched* or *Crutched* Friars. They came to England in the 13th c., and had monasteries in London, Oxford, and Ryegate.—The festival of the *Elevation of the Cross* (14th September) commemorates its re-erection in Jerusalem by the Emperor Heraclius in 628, after it had been carried away by the Persians.

**CROSS**, The Order of the, originally a spiritual order of knighthood, which sprang up in Palestine in the time of the Crusades, and was then called the *Bethlehemite Order.* After the commencement of the 13th c., the knights of this order adopted the monastic life, settling chiefly in Austria, Bohemia, Moravia, Poland, and Silesia. Pope Gregory IX. confirmed the order in 1328. Its principal seat is now in Bohemia, and its members generally hold ecclesiastical preferments or professorships in the university of Prague. They are distinguished by a C. of red satin, with a six-pointed star under it, and are sometimes called *Stelliferi.*

**CROSS**, The Southern, the most conspicuous constellation in the southern hemisphere, situated near the Antarctic Circle, and therefore never visible to our latitude. It consists of four bright stars, to which the fancy, aided by Christian associations, readily gives the cruciform shape. The two brilliant stars which mark the summit and foot of the C. have nearly the same right ascension. The constellation, therefore, is almost perpendicular when passing the meridian, and these two stars act as pointers to the Antarctic pole.

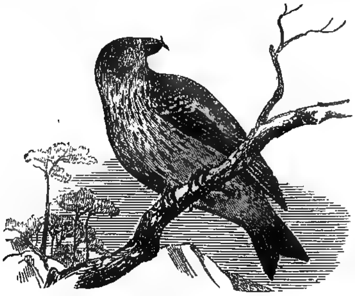
**CROSS**, Victoria. The peculiarities of this decoration, which was instituted on the termination of the Crimean campaign in 1856, are, that it may be granted to a soldier of any rank, and for a single act of valour. The C. of the Legion of Honour, as was felt during the Crimean campaign, served a purpose in the French army which was served by none of our decorations, and it was in imitation of it that the Victoria C. was founded, with the inscription 'For Valour,' and which can be given to none but those who have performed, in presence of the enemy, some signal act of valour or devotion to their country. The general distribution of the crosses earned in the Crimean war took place in Hyde Park on the 26th June 1857. The recipients were 62 in number. The Victoria Cross is in the form of a Maltese Cross, formed from the cannon captured at Sebastopol. In the centre is the royal crown, surmounted by the lion, and below, on a scroll, the words, 'For Valour.' The ribbon is blue for the navy, and red for the army. On the clasp are two branches of laurel, and from it the cross hangs, supported by the initial 'V.' The decoration is accompanied by a pension of £10 a year.



Victoria Cross.

**CROSS BILL IN CHANCERY** is a suit brought by the defendant against the plaintiff in the original suit, for the purpose of setting up some claim or defence which could not be maintained in the original suit.

**CROSSBILL** (*Loxia*), a genus of birds of the family *Fringillidæ*, much resembling bullfinches, linnets, &c., except in the bill, which is altogether singular; the two mandibles—which are rather long, thick at the base, and much curved—crossing each other at the points, when the bill is closed. In different individuals, even of the same species, the upper and lower mandibles are found variously directed to the right and left. This conformation was rashly characterised by Buffon as 'an error and defect in nature, and a useless deformity;' whereas, it is an admirable adaptation to the wants and habits of the birds, and other peculiarities of their structure beautifully correspond with it—the bill being articulated to the head in such a manner that the mandibles are capable not merely of vertical but of lateral motion, and muscles of extraordinary power, in comparison with the size of the bird, being provided for moving them. The result of all this is, that the crossbills readily obtain their principal food, the seeds of firs and pines, by tearing up the cones. They bring the points of the mandibles together—which they can do so as to pick up a very small seed—and insert them into the cone, when a powerful lateral movement widens the opening quite sufficiently, and the tongue, which terminates in a singular movable scoop, formed of a bone articulated to the *os hyoides*, or ordinary bone of the tongue, is inserted to detach the seed. The power of the bill is such that it can be employed in its lateral movements to tear wood to pieces, and crossbills in confinement seem to take a mischievous pleasure in so employing it, and by this means, and pulling at wires, soon destroy any ordinary cage. An apple is cut to pieces almost in an instant, in order that its seeds may be reached; and flocks of these birds sometimes do great mischief in orchards. Only three species are known, all of which have been found in Britain, although only one, the common C. (*L. curvirostra*) is of frequent occurrence. It sometimes occurs in considerable numbers, but in most years is scarcely to be seen. It is a native of Europe, Asia, and North America, dwelling chiefly in pine forests, and extending as far north as they do, not dreading the coldest climates.



Crossbill (*Loxia curvirostra*).

**CROSS-BOW.** See Arbalest, Archers and Archery.

**CROSS BREEDING.** See Breeding.

**CROSS BUNS**, a small cake specially prepared for Good Friday, and in many towns of England cried about the streets on the morning of that day as 'Hot-cross buns.' *Bun*, means simply a round cake—properly, a lump, being from the same root as *bunion*, Ital. *bugno*, a bump or knob; allied is the Gael. *bonnach*, a cake, a *bannock*. Good-Friday buns were appropriately marked with the cross, and hence the name. The origin of the practice is obscure. Most probably it is a relic of some heathen observance, to which the early church gave a Christian significance. At Chelsea, there were formerly two celebrated bun-houses, besieged on Good Friday from morning until night by hundreds of eager purchasers, but they have long since disappeared.

**CROSS CROSSLET.** See Cross.

**CROSSE, Andrew**, a remarkable experimenter on electricity, born at Fyne Court, in the Quantock Hills, Somersetshire, June 17, 1784, was educated at Bristol and Brasenose College, Oxford, and in 1805—1806, settled on his paternal estate, where he began to devote himself to the study of electricity. Happening on one occasion to examine a cavern near his residence, he found reason to conclude that the crystallisations on the walls and roof were partially, at least, the effect of the operation of this subtle agency. In 1807, he commenced experiments with the view of forming artificial crystals by electricity. He took home some of the water which dropped from the roof of the cave, and exposed it to the action of a voltaic battery for ten days, when he found crystals of carbonate of lime forming on the negative platinum wire. C.'s endeavours to form crystals of various sorts were very successful. After 30 years of quiet research, during which period he remained totally unknown to the learned world, he obtained no less than 24 minerals, crystals of quartz, arragonite, carbonates of lime, lead, and copper, besides more than 20 other artificial minerals. Explaining his discoveries at the meeting held by the British Association for the Advancement of Science, at Bristol in 1836, he received high praise from its most distinguished members. On this occasion, he also expressed his belief that every kind of mineral would yet be formed by the ingenuity of man. But his most startling discovery occurred a few months after. While experimenting with some highly caustic solutions, out of contact with atmospheric air, there appeared, as if gradually growing from specks between the poles of the voltaic circuit, certain animals of the genus *acarus*. C. never affirmed that he had developed animal life out of inorganic elements, but simply that under certain physical conditions he could make acari appear, and not otherwise. The 'discovery' made a great noise at the time. The possibility of the fact was, of course, denied by all those persons who 'take the high *priori* road,' and have made up their minds as to what facts alone are possible; but Faraday declared that he had seen, during the same year, similar appearances in his own electrical experiments. C. was accused of 'impiety,' and of being 'a reviler of our holy religion,' and although a very pious man, was actually compelled to defend himself against such pitiable charges. It is humiliating to state that, in spite of his defence, various honours to which he was justly entitled, were lost to C. in consequence of his discovery. C. also invented a method of purifying sea-water by electricity, improved wines, spirits, and cider by the same process, and shewed that it might be usefully applied to vegetation. He died July 6, 1855. An excellent memoir of him was published by his widow (1857).

**CRO'SS-EXAMINA'TION.** The examination of a witness by the party against whom he was adduced. In England, the following are the principal rules affecting C.: 1. The witness may be cross-examined on the whole case, and not merely on the points on which he had been examined in chief. 2. Leading questions may be put in cross-examination. 3. Irrelevant questions may often be put, but if for the mere purpose of impeaching the witness's credit, they are inadmissible. 4. For the purpose of impeaching the character of the witness, he may always be asked whether he has been guilty of a crime, but he is not always bound to answer. 5. Evidence may be brought to contradict the answer given on C., on relevant facts, but not on irrelevant, unless the irrelevant fact be the conviction of the witness of a felony or misdemeanour. 6. A witness may be cross-examined as to any previous statement made by him relative to the trial (except matter of mere opinion as to the merits of the case), and evidence may afterwards be brought to contradict him. See EVIDENCE.

**CROSSOPO'DIA**, a genus of annelids determined from markings on the surface of Silurian slates. Nothing exhibiting structure has been observed—the surface of the slate is not even darkened by the organisms, which the markings shew to have been nereid-like worms of some six inches in length. The extraordinary length, 'probably many yards,' which was ascribed to this animal, has been shewn by Alexander Bryson to be founded on a confusion of the body with the track formed by the passage of the creature through a crisp rather than a slimy mud, the track having been filled up with dry blown dust, which gives it an appearance and structure different from those of the surrounding matter.

**CROTALA'RIA** (Gr. *krotalon*, a rattle), a genus of plants of the natural order *Leguminosæ*, sub-order *Papilionaceæ*, deriving its name from the inflated pods in which the seeds rattle when ripe. The species are numerous; annual, perennial, and shrubby plants, natives of the warm parts of the world. Many of them have long, straight, slender stems and branches, and some of these yield valuable fibre, particularly *C. juncea*, the SUNN (q. v.), or Sunn Hemp of India, an annual species, the fibre of which is now an important article of commerce. JUBBULPORE HEMP, also an important fibre, and regarded as stronger than Sunn, is the produce of *C. tenuifolia*, a perennial species about nine feet high, a native of the south of India, which, when growing in abundant space, throws out many branches; but when sown thick, grows with little branching. *C. Burhia*, which naturally grows in very arid places, is also cultivated in Sinde for its fibre; and that of *C. retusa* is employed in the Madras presidency. *C. juncea* is also often sown in India, to be used in a young state for feeding cattle.

**CROTA'LIDÆ**, a family of venomous serpents, agreeing with *Viperidæ* in their general form and appearance; in their large head, which is broad behind and has a short muzzle; in their short tail; and in having long fangs in the front of the upper jaw, which is destitute of other teeth; but differing from them in having a large pit—the use of which is not known—on each side of the face between the nostril and the eye; and in having the tail terminated by a sort of horny spine or by a rattle. Many of the most dangerous serpents of the warm parts of Asia and America belong to this family, which receives its name from the rattlesnakes (q. v.) (Gr. *crotalus*, a rattle) of America, and contains also the genera *Trigonocephalus*, *Craspedocephalus*, *Lachesis*, &c.

**CROTCH**, WILLIAM, a distinguished musical composer, was born at Norwich in 1775. His musical genius was quite as precocious as that of the great Mozart. When little more than three years old, it is said that he could play *God save the King* almost throughout with chords, and the accuracy of his ear was such that he could detect in a moment what note was struck, and in what key the music was composed. When only 22, C.'s abilities were so much appreciated that he was appointed Professor of Music in Oxford University, the degree of Doctor of Music being conferred upon him. In 1822, he obtained the principalship of the Royal Academy of Music. C. composed a large number of pieces for the organ and piano, as well as many vocal pieces. He was author of *Elements of Musical Composition and Thorough Bass*, and *Styles of Music of all Ages*, 3 vols. He died December 29, 1847.

**CRO'TCHET.** See NOTATION, MUSICAL.

**CRO'TON**, a genus of plants of the natural order *Euphorbiaceæ*, having male and female flowers generally on the same plant; the male flowers with five petals; the female flowers with three styles, which are either forked or divided into many branches; the capsules 3-celled, with one seed in each cell. The species are numerous, mostly tropical or subtropical trees or shrubs, a few herbaceous. Some of them possess in a very high degree the acrid properties so characteristic of the order to which they belong. Among these, the most important is the PURGING C. (*C. Tiglium*), a small tree, a native of India and the more easterly tropical parts of Asia. The leaves are extremely acrid; the wood in a fresh state is a drastic, and in a dried state, a more mild purgative; and the seeds (*C. Seeds*, or *Tilly Seeds*) are an extremely powerful drastic purgative, formerly much employed in Europe, but latterly disused on account of violence and uncertainty of action, although still valuable as yielding C. OIL (q. v.). They are oval, or oval-oblong, about the size of field-beans. So great is their acridity, that dangerous effects have ensued from working for some hours with packages of them. The oil is obtained mostly by expression, and partly by treating the cake with alcohol.—The wood and seeds of *C. Pavana* are employed in some parts of the East in the same way as those of *C. Tiglium;* and the wood is supposed to be the *Lignum Pavanæ* or *Panavæ* of commerce. Other species possess similar properties.—Very different are the properties of the species which yield Cascarilla (q. v.) and Copalche (q. v.) barks, to which a great resemblance exists in the barks of a number of species, natives chiefly of America.—Other species are still more aromatic, and some delightfully fragrant, containing in great abundance a thickish balsamic sap. The sap of *C. gratissimus* is much employed as a perfume and cosmetic at the Cape of Good Hope; that of *C. origanifolium* is used in the West Indies as a substitute for Balsam of Copaiva; that of *C. balsamiferum*, also West Indian, furnishes *Eau de Mantes* by distillation; and the balsamic sap of some South American species is dried and used as incense.

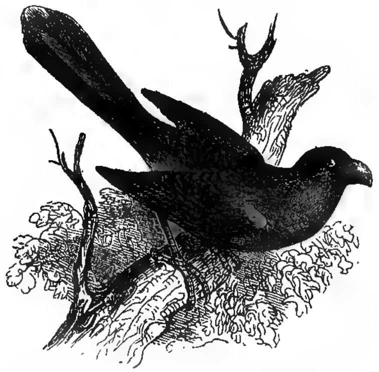
**CROTON A'QUEDUCT.** See AQUEDUCT.

**CROTON OIL** is of an unctuous consistence, and varies in colour from a pale yellow to a dark reddish-brown or deep sherry colour. It is not miscible with water, but dissolves in alcohol and in ether. It has an acrid taste, and an unpleasant but characteristic odour, and is a powerful purgative, one drop of the pure oil being a sufficient dose. When rubbed upon the skin, it produces rubefaction and pustular eruption, and thereby tends to relieve some affections of the internal organs. It is used either by itself in the unmixed state, or diluted with olive oil, soap liniment, alcohol, &c. It is not to be employed except with caution.

**CROTON RIVER.** See NEW YORK.

**CROTO'PHAGA** (Gr. tick-eater), a genus of birds of the order *Scansores*, or Climbers, allied to trogons and toucans, and of which some of the species are known by the names ANI and KEEL-

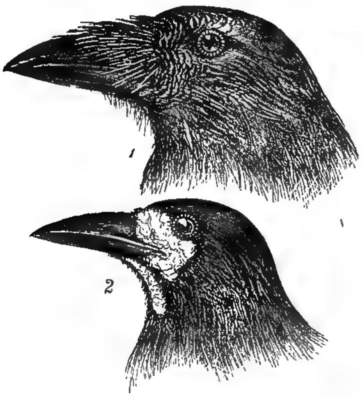
BIRD, the former from their cry, the latter from the high, blade-like ridge which surmounts the short, much compressed, arched bill. The tail is fan-shaped. *C. Ani*, often called the SAVANNA BLACKBIRD, is common in the West Indies and warm parts of America, inhabiting savannas and open pastures, particularly those which are occupied by cattle or horses, and feeding chiefly on insects, partly also on berries. It uses the sharp ridge of the bill in opening out earth, dung, &c., in search of insect prey. It often perches on the backs of horses or cattle, to feed on ticks, and may be seen clinging to a cow's tail; the important service which it renders being apparently well appreciated.



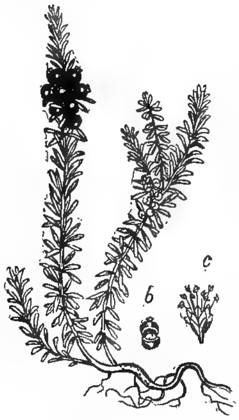
Savanna Blackbird (*Crotophaga Ani*).

**CROUP**, a severe and fatal disease of infants, known from a remote period, but first scientifically described by Dr Francis Home in 1765, as a suffocative affection of the breathing, depending upon the formation of a false membrane or fibrinous deposit on the mucous membrane of the windpipe or Larynx (q. v.). It is proper to remark that the inflammatory disease described by Home has been frequently confounded with a purely spasmodic affection of the larynx, the asthma of Millar, or *laryngismus stridulus* of Dr Mason Good; and also with Diphtheria (q. v.), in which a false membrane is formed on the pharynx and palate, as well as in the larynx. C., in the more restricted sense, begins with symptoms resembling Catarrh (q. v.), but differing in the greater degree of feverishness and hoarseness. In a short time, the respiration becomes difficult and noisy; a very peculiar hissing sound is heard accompanying the drawing of each breath; the cough is harsh and brassy; the countenance is injected, the expression very feverish and anxious, the voice entirely lost, or very much altered. This state is soon followed by one of suffocation, unless the little patient is relieved by expectoration, which, however, frequently takes place in the midst of vomiting or coughing, a quantity of membranous shreds being brought up from the windpipe along with glairy mucus, and sometimes streaks of blood. In the worst cases, the spasms of ineffectual coughing, and the constantly increasing obstruction to the breathing, are most painful to witness; and a period of tossing, extreme suffering, and anxiety is succeeded either by gradual insensibility, or by convulsions, which are very soon followed by death. True C. is rarely seen after the age of puberty, and is rather uncommon before the termination of the first year of life. It may occur, however, at any age, and has essentially the same characters as are above described. It is supposed to be due in some measure to Endemic (q. v.), and partly also to Epidemic (q. v.) causes. It is most common in cold and moist climates and seasons, and in low-lying, but exposed situations. The variations in its prevalence, however, are by no means fully explained. The treatment of C. requires to be very active and decided, and yet free from rashness. In cases of highly inflammatory type, and in robust children, it may be proper to take blood from the arm, or to place one or more leeches (according to the age of the child) over the top of the breast-bone. An emetic should also be given as soon as possible, composed of a full dose of tartar-emetic or of ipecacuanha, or both together. Some prefer sulphate of copper given in repeated doses: in America, a preference is given to alum and honey mixed into a paste, and given in teaspoonful doses. The emetic may be repeated, if necessary, every two or three hours, and the child should at intervals be placed in the warm bath. It needs hardly be added that medical advice should be procured without a moment's delay, whenever it is within reach, for the disease is one of extreme danger, and almost all the most effective remedies require experienced hands for their safe administration. In extreme cases, Tracheotomy (q. v.) has been resorted to with success.

**CROW** (*Corvus*), a genus of birds, the type of the family *Corvidæ* (q. v.). The largest species of this genus is the Raven (q. v.). The Rook (q. v.) also belongs to it. Besides these and the Jackdaw (q. v.), there are two other species found in Britain, the COMMON or CARRION C. (*C. corone*), and the ROYSTON C. or HOODED C. (*C. cornix*). They differ from one another chiefly in colour, the Carrion C. being black, the Hooded C. gray, with black head, throat, wings, and tail. The Hooded C. is also rather larger than the Carrion C., which, in size, nearly agrees with the rook, but which may readily be distinguished from that species by having the base of the bill and the upper part of the throat not naked and rough, but closely feathered. The name Hooded C. is derived from the appearance of the black head, contrasted with the gray body, but in some parts of Scotland is, without any show of reason, popularly transferred to the Carrion C., under the form *Hoody*. Both of these species have habits much more resembling those of the raven than of the rook; they seldom or never associate in flocks, and not only prefer carrion to worms, insects, or vegetable food, but watch and attack very weak animals, such as young lambs. On this account, a premium is in many places given for their destruction, and gamekeepers relentlessly pursue them on account of their robbing nests, from which they take either the eggs or the helpless young. Their own nests are built in trees, or if these are not to be found, among high rocks. They both occasionally frequent the sea-coast, feeding on shell-fish, &c. Both are widely distributed over Europe and the northern parts of Asia.—The C. of North America (*C. Americanus*) is very similar to the Carrion C., but rather smaller, and, after the breeding season is over, congregates into great flocks: it is also partially migratory, great numbers from the more northerly parts moving to the south on the approach of winter. Its habits are otherwise intermediate between those of the Carrion C. and the rook.—The FISH C. (*C. ossifragus*) frequents the coasts and southern rivers of the United States, feeding chiefly on fish, which it catches with great dexterity. It also sometimes assails gulls, and compels them to disgorge their prey.—The JABBERING C. (*C. Jamaicensis*) of the Blue Mountains of Jamaica is remarkable for the resemblance of its voice to human speech, which some of the other species of this genus, as the raven, it is well known, can be taught to imitate. Sir J. E. Tennent gives an interesting account of the small glossy C. of Ceylon (*C. splendens*), which frequents the towns, feeding on offal, and boldly entering rooms through open windows, to snatch some morsel from the dinner-table. Habits of pilfering are more or less prevalent among the different species of crow. The accompanying cut of the heads of the raven (fig. 1) and the rook (fig. 2) illustrates well the prevalent characters of the bill in this genus, shewing also in the raven the bristles which, as in most of the species, surround its base, but which are wanting in the rook; and contrasting the greater strength of neck, head, and bill which belongs to the more carnivorous as compared with the more frugivorous species.—The Red-legged C. is the Chough (q. v.).—The name Carrion C. is given in America to the Black Vulture. See Vulture.—The Piping C. of New South Wales is a Baritah (q. v.).



**CRO'WBERRY**, or **CRAKEBERRY** (*Empetrum nigrum*), a small procumbent shrub, of the natural order *Empetraceæ*, a native of the northern parts of the world, abundant in the moors of Scotland and the north of England. The order consists of a few heath-like shrubs, which, however, are regarded as having a botanical affinity to *Euphorbiaceæ* (Spurges, &c.), with small unisexual flowers in the axils of the leaves, the fruit a small berry seated in the persistent calyx. The berries of the C. are nearly black, surround the branches in crowded clusters, and each contain 6—9 bony seeds and a watery acidulous juice, which is sometimes felt to be not unrefreshing; but they are generally little esteemed. A fermented or vinous liquor is prepared from them in some northern countries. They are a favourite food of game. *E. rubrum*, a native of the vicinity of Cape Horn, differs little from the northern plant, except in having red berries. The berries of the Camarinheira (*Corema alba*) are employed in Portugal for the preparation of an acidulous liquor, which is used as a drink in fevers.



Crowberry:
*b*, fruit cut open; *c*, flower.

**CRO'WFOOT.** See Ranunculus.

**CRO'WLAND**, or **CROYLAND**, an ancient town in the south of Lincolnshire, on the Welland, in a low flat district in the Fens, 48 miles south-south-east of Lincoln. There once existed here a large abbey, built about 1200, and there still exist the remains of a church founded by King Ethelwald in 716. At the confluence of the Welland and the Nene, there is a curious triangular bridge, built probably in the 14th c. on the site of an older one erected about 860. Ingulfus, the historian, was abbot of Croyland. Pop. 2466.

**CROWN** (Lat. *corona*, Wel. *crwn*, and Gael. *cruinn*, round). Crowns were originally garlands of leaves; and in this form they have probably been used as an ornament for the head by almost every people. They were much used by both the classical nations on joyous and on solemn occasions. Among the Greeks, the C. (*stephanos*) was sometimes used as an emblem of office, as in the case of the archons; sometimes as an ornament for the heads of the victors in the public games; and sometimes as a mark of distinction for citizens who had merited well of their country. Crowns of the latter class were made at first of twigs of laurel, but latterly of gold. The Romans made use of crowns to a greater extent than the Greeks, chiefly as rewards for valour. The most highly prized was the *Corona obsidionalis*, which was bestowed by a beleaguered garrison or army on the general who rescued them. It was made of grass or wild-flowers, gathered from the place which had been enclosed by the enemy. Next in order was the *Civic C.*, a garland of oak-leaves and acorns, which was given as a reward to any soldier who had saved the life of a Roman citizen in battle. For the soldier who wore it, a place next to the senators was reserved at the public spectacles, and both the senate and the assemblage rose up on his entrance. Not only he, but his father and paternal grandfather were free from all public burdens; and the person whose life he had saved was bound ever after to shew him the duty which a son owes to a father. The civic C. is sometimes used in heraldry.

Corona Muralis.

Civic Crown.

Another of the Roman crowns was the *Corona muralis*, which was bestowed on him who first scaled the wall of a besieged city. It was a golden ring surmounted with turrets or battlements. It is often used in modern heraldry.

The *Corona triumphalis*, which was of three kinds, was bestowed upon a general when he obtained a triumph.

But there was a totally different class of crowns, which were not honorary, but emblematical, and which were not regulated by law, like the former ones, but by custom. Of these, the most important were: 1. The *Corona sacerdotalis*, worn by the priests and bystanders when engaged in sacrifice, with the exception of the *pontifex maximus*. It was sometimes of olive leaves, sometimes of ears of corn, and sometimes of gold. 2. *Corona funebris* or *sepulchralis*, with which the dead was crowned, a custom which prevailed both among the Greeks and Romans. A law of the Twelve Tables provided that if any one had been crowned while living, the C. should be placed on his head when carried out to burial. Crowns were also placed on the bier, and scattered from the windows under which the procession passed. In Greece, these crowns were commonly of parsley. 3. *Corona convivialis.* The custom of wearing wreaths on festive occasions, which, like most of the Roman customs, was derived from Greece, is supposed to have originated in the habit of tying a woollen fillet round the head, to mitigate the effects of intoxication. As luxury increased, they were made of such flowers and shrubs as were supposed to prevent intoxication, roses, violets, myrtle, ivy, and even parsley. 4. *Corona nuptialis*, or bridal-wreath, made of flowers plucked by the bride herself, and not bought, which was of bad omen. Amongst the Romans, it was made of verbena. 5. *Corona natalitia*, a chaplet suspended over the door of the vestibule in which a child was born.

Several other classical crowns are mentioned in the very elaborate article on the subject in Smith's *Dictionary*, to which we have been indebted for much of the preceding information.

As the emblem of sovereignty in modern Europe, the C. was borrowed rather from the Diadem (q. v.), than the crowns of antiquity. This decoration was originally Oriental. Alexander the Great adopted it from the kings of Persia; and Antony assumed it during his luxurious intercourse with Cleopatra. According to some, its adoption for the gods originated in the fillet, which was assigned to Bacchus for the purpose mentioned as that which led to the use of the convivial crown. In modern states, crowns were of very various forms, till heralds devised a regular series of them to mark the various gradations of sovereignty, from that of the emperor down to what are now called the coronets of counts and barons. The pope also had his triple crown. See Tiara. So entirely was the C. regarded as the symbol of sovereignty, that the word came often to be used as synonymous with the monarchy—a sense in which we still speak of the C. of England, and the domains and possessions of the crown.

The crowns of kings and emperors are closed above, whilst the coronet of a noble is merely an open circlet surrounding the head; hence, *to close the C.* has been the ambition of princes desirous of shaking off the authority of feudal superiors, and assuming a complete sovereignty.

The royal C. of Great Britain is a circle of gold enriched with stones and pearls, and heightened with four crosses pattée, and four fleurs-de-lis alternately. From these rise four arch-diadems, adorned with pearls, which close under a mound, ensigned with a cross pattée. The C. used at the coronation of Queen Victoria was adorned in accordance with the taste of the present time.

The coronet of the Prince of Wales is a circle of gold, set round with crosses pattée and fleurs-de-lis, but has only one arch, decorated with pearls, surmounted with a mound and cross, and bordered with ermine. In addition to his coronet, the Prince of Wales has a cognizance consisting of three ostrich feathers, argent, quilled or, enfiled with a prince's coronet of the last, with an escrol azure, whereon are the German words *Ich dien* (I serve). For the traditionary origin of this badge, see Wales, Prince of.

The younger sons and brothers of the sovereign wear as coronet a circle of gold, bordered ermine, heightened with fleurs-de-lis, crosses pattée, and strawberry leaves alternately. Nephews of the blood-royal have strawberry leaves on their coronets, where the sons and brothers have fleurs-de-lis. Princesses-royal have a circle of gold, bordered with ermine, and heightened with crosses pattée, fleurs-de-lis, and strawberry leaves alternately. For the coronets of the different orders of nobility, see their *titles*.

The Crown is a term often employed to signify the state, and the matters under control of the executive authority. Thus, in the interests of the state there are C. ministers, C. lawyers, C. officers, C. lands, &c.—the term, in no instance, having any special connection with the sovereign personally. In Scotland, certain high crimes are technically called Pleas of the Crown. These are four in number—murder, robbery, rape, and wilful fire-raising—and fall within the jurisdiction of the High Court of Justiciary. Likewise, in Scotland, there is a functionary styled C. agent. He is a practising law-agent or solicitor, who, under the Lord Advocate and his deputes, takes charge of criminal proceedings. His duty is to receive from the procurators-fiscal of the different counties the precognitions which they have taken, and to lay these precognitions before the lawyers for the crown, that they may determine whether there is ground sufficient to call for a prosecution. He also expedes indictments and criminal letters, and otherwise discharges the duties of an agent in preparing and assisting in the conduct of trials before the High Court of Justiciary, which are generally superintended or conducted by the Solicitor-general. The appointment of the C. A. is with the Lord Advocate, and ceases with the administration.

**CROWN DEBTS.** It is a prerogative of the crown to take precedence of all other creditors, and in England, to recover its debts by a summary process called an *extent.* By 33 Henry VIII. c. 39, this preference is given over all creditors who have not obtained judgment for their debts before the commencement of the crown's process; and the act 6 Anne, c. 26, extended the law of England in this respect to Scotland. The rule in Scotland, however, was limited to movable or personal property, and the crown has no privilege over a subject in a competition for heritage. It obtains, however, as opposed to the landlord's Hypothec (q. v.). Mercantile sequestration has no effect against the crown. The sanctuary of Holyrood House affords no protection to the king's debtor. See Extent, Exchequer.

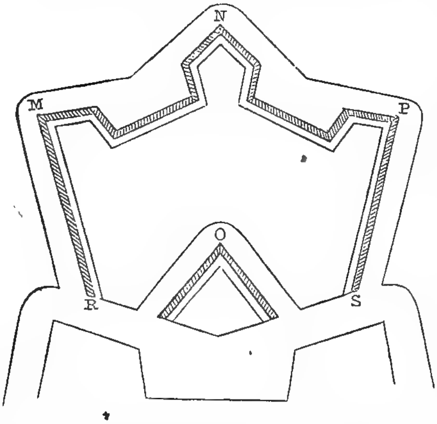
**CROWN IMPE'RIAL.** See Fritillary.

**CROWN LANDS.** The demesne lands of the crown are now contracted within narrow limits, having been almost entirely granted away to subjects. King William III. so impoverished the crown in this manner, that an act was passed, 1 Anne, c. 7, s. 5, the effect of which and of subsequent statutes, is, that all grants or leases from the crown of royal manors, or other possessions connected with land, for a period exceeding 31 years, are void. At a much earlier period (1455, c. 41), a Scottish statute had rendered the consent of parliament necessary to the alienation of the property of the crown; but neither it, nor the subsequent statutes, which were passed with a similar object, succeeded in checking the practice. The superintendence of such property as still belongs to the crown is now vested in commissioners appointed for the purpose, called the Commissioners of Woods, Forests, and Land Revenues. See Woods and Forests.

**CROWN POINT,** a post village in the state of New York, on the west side of Lake Champlain, about 75 miles north of Albany. Being within the basin of the St Lawrence, it formed part of French Canada. With the view of bridling the English on the south, it was made the site of a fort famous in the American war, but of which the ruins only now remain. The immediate neighbourhood is now a township of about 2500 inhabitants.

**CROWN SOLICITOR**, the solicitor to the Treasury, who, in state prosecutions in England, acts as solicitor for the crown in preparing the prosecution. In Ireland, there are crown solicitors attached to each circuit, whose duties correspond in some degree to those of the Procurators-fiscal (q. v.) and Crown Agent in Scotland. See CROWN. In England, there are no analogous officers, and prosecutions are consequently conducted by solicitors appointed either by the parish, or by private parties bound over by the magistrates to prosecute. But in cases of great importance to the public, such as unusual or monstrous crimes, it is of frequent occurrence that the Solicitor to the Treasury takes charge of the case and instructs counsel.

**CROWN-WORK**, in Fortification, is formed to strengthen a weak front, or to occupy ground which might facilitate the enemy's operations. It consists of two faces inclined to each other at an angle, with a bastion in the middle, and half-bastions at the two ends; and it is connected with the main body of the work by two long sides. One form of C. is shewn in the annexed cut, where RMNPS is the C., in front of and protecting the ravelin O. Both of these works are entirely beyond the main ditch of the place, but each has also a ditch of its own.



**CROW'S-FEET**, in Siege Operations. See CALTHROP.

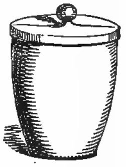
**CROW-STONE**, the top stone of the gable-end of a building. See CORBIE STEPS.

**CROY'DON** (Fr. *croie dune*, chalk-hill), a town in the north-east of Surrey, on the London and Brighton Railway, 10½ miles south of London Bridge. It lies on the edge of the chalk and plastic clay, near the Banstead Downs, at the source of the Wandle. The chief street, a mile long, forms part of the main road to Brighton. The principal trade is in corn. The October fair is also noted for walnuts. Pop. 10,260. The Archbishops of Canterbury had a palace here till 1750. This palace is now a factory, and the summer seat of the archbishops is now at Addington, 4 miles east of Croydon. Near C., Roman gold coins have been found, and here also is a cluster of 25 tumuli, and a circular camp with a double moat. C. has numerous springs. About a mile from C., is Addiscombe House, at one time the residence of the first Earl of Liverpool, but purchased by the East India Company in 1809. When enlarged by other buildings, it became a Military Academy, at which cadets were educated for the Artillery and Engineer services of the Company. At a later date, the Infantry cadets also received their professional education there. In 1858, when the government of India was transferred from the Company to the Crown, Addiscombe Academy was transferred in like manner. It is now called the Royal India Military College. It was in 1860 divided into two portions, a 'Senior or Scientific Department,' and a 'Junior or Infantry Department,' both open to officers intended for the India service. C. has one of the finest Gothic churches in the county.

**CROZE'T ISLANDS**, a volcanic group to the south of the Indian Ocean, lie between Kerguelen's Land on the east and Prince Edward's Islands on the west, about midway between Patagonia and New Zealand. The most easterly link of the chain is in lat. 46° 27′ S., and long. 52° 14′ E.

**CRU'CIAN** (*Cyprinus carassius*), a fish of the same genus with the Carp (q. v.) from which it differs in the want of barbules at the mouth, in the much greater depth of body, and in the almost square tail. It attains a considerable size. It inhabits lakes, ponds, and slowly flowing rivers, in the north of Europe and of Asia. It is called *Karussa* in Sweden. It exists in the Thames, although rare, and is called the *German Carp*, but has perhaps been introduced. It is an excellent article of food. The introduction of the C. into some of the waters of the northern parts of Britain seems particularly desirable.

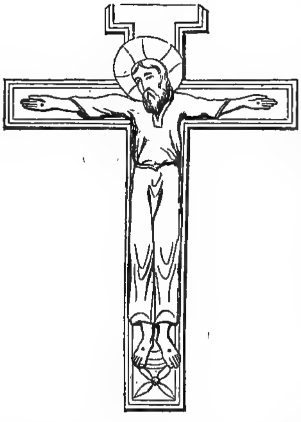
**CRU'CIBLES** are vessels employed for the heating and fusing of glass, metallic ores, &c., and are generally made of materials capable of resisting high temperatures, such as fire-clay, black-lead, porcelain, platinum, and silver.


Crucible.

**CRUCI'FERÆ** (Lat. cross-carrying), an important natural order of exogenous plants, including about 1600 known species, and corresponding with the class *Tetradynamia* of the Linnæan system. See BOTANY. The flowers have a calyx of four sepals, which fall off after flowering; and a corolla of four petals, which are placed in the form of a cross—whence the name C.—and alternate with the sepals. There are six stamens; four long ones in opposite pairs, and two short ones between the pairs of long ones. The ovary is superior, and there are two stigmas. The fruit is either long and podlike (a *silique*), or a short and roundish *pouch* (*silicule*); one-celled, or (usually) spuriously two-celled, by the parietal placentæ (see PLACENTA) meeting in the middle, and forming a kind of Dissepiment (q. v.); and contains either one seed, or many in a single row. Linnæus divided his class *Tetradynamia* into the orders *Siliquosa* and *Siliculosa*, according to the form of the fruit, and these may also be regarded as forming sub-orders of this natural order; but another division has more recently been adopted, founded on the character of the Cotyledons (q. v.), and the manner in which the radicle is folded upon them (cotyledons *accumbent*, *incumbent*, or *conduplicate*). The general character of the order is antiscorbutic and stimulant, with more or less acridity. It contains many plants extensively cultivated for the food of man and of domestic animals, or valuable in medicine, as Kale (Cabbage, Cauliflower, Broccoli, Colewort, &c.), Turnip, Rape, Radish, Cress, Horse-radish, Scurvy Grass, Mustard, Sea-kale, Gold of

Pleasure, &c. The dye-stuff called Woad is produced by a plant of this order. It includes also a number of garden-flowers highly esteemed for their beauty and fragrance, as Wallflower, Stock, Rocket, &c. The pungency and acridity of the C. seems to depend on a volatile oil, or on different volatile oils of very similar character, present in very various degree in different species, or in the same species under different circumstances, and in different parts of the same plant. This diversity is very well illustrated in the common turnip; in the different qualities of the root, as to sweetness and acridity, in different soils or seasons, and in the difference between the flesh and the rind. The seeds of the C. contain a fixed oil, which is extracted from some (Rape, Colza, in Europe; *Myagrum sativum* and *Erysimum perfoliatum* in Japan), to be used as a lamp-oil and in the arts, and the oil-cake is valuable for feeding cattle. The plants of this order belong mostly to the temperate parts of the world, and particularly abound in Europe. Comparatively few are found within the tropics.

**CRU'CIFIX** (Lat. *crux*, the cross, and *figo*, I fix), a cross with the effigy of Christ fixed to it. The principal C. in Roman Catholic churches stands in the centre of the high-altar. It overtops the tapers, and is only removed at the elevation of the host. In well-appointed churches, the altar crucifix is generally either of gold or silver. Crucifixes are used in Lutheran churches, and in Prussia they are often made of Berlin iron. The C. first began to take the place of the plain cross in the time of Constantine, but it was never publicly acknowledged by the Greek Church, and did not come into general use in the East till towards the end of the 8th century. It was not till the Carlovingian age that it became general in the Latin Church. On the earlier crucifixes, Christ is represented as alive, with open eyes, and generally clad, and fastened with four, not three nails. We offer a representation of an ancient form of C., with the body of Christ clothed, and four nails as fastenings, also the glory or nimbus round the head.—Fairholt's *Dictionary of Terms of Art*. In later times, all these circumstances varied. Christ was often represented as dead, naked, except a cloth round the loins, and fastened with three nails; i. e., the two feet fastened together by one nail. The earlier artists usually represented the figure of Christ as haggard, and his countenance as sorrowful in the last degree; but latterly the custom was introduced of representing him as the ideal of human beauty, and of throwing into his countenance an expression of rapture and heavenly joy. See Cross.



**CRU'DEN**, Alexander, was born at Aberdeen, 31st May 1700, and educated at Marischal College, with a view to the church, but having exhibited decided symptoms of insanity, he was for some time placed in confinement. On his release, he left Aberdeen, and after spending several years as a tutor, settled in London in 1732, first as a corrector of the press, and afterwards as a bookseller. In 1737, appeared his *Complete Concordance of the Holy Scriptures of the Old and New Testament*, a really great work, which has laid divines especially under deep obligations to the laborious author. The book was dedicated to Queen Caroline, who graciously promised to 'remember him,' but unfortunately died a few days after. C. now relapsed into insanity, and his friends were obliged to remove him to a private asylum, where he appears to have been harshly treated. On his recovery, he published an account of his sufferings. For the next fifteen years he acted as a corrector of the press, but, in 1753, he had again to be put under restraint, but only for a few days. C. now believed himself divinely commissioned to reform the manners of the world, and styled himself Alexander, *the Corrector*. He went about the country exhorting the people to keep holy the Sabbath day, &c. He also petitioned the king for the honour of knighthood, and the parliament to constitute him by act, 'the Corrector of the People,' hoping by such honours to influence the people more effectually. Several other foolish things were done by C. in the course of his life, but he also performed many virtuous and benevolent actions, which shed a pleasing light over his melancholy career. C. died at Islington, November 1, 1770. There have been many editions and abridgments of C.'s Concordance published both in Britain and America. One of the best known is that of Chalmers (London, 1812; 10th ed. 1824).

**CRUI'KSHANK**, George, the most celebrated of living English caricaturists, was born in London about 1792. His father was a native of Aberdeenshire, and the son of a person who had fought for Prince Charles Stuart at Culloden. C. at first thought of the stage as a profession; but some of his sketches having come under the notice of a publisher, he was induced to engage in the illustration of children's books and songs. When about twenty years of age, a publication, called *The Scourge*, afforded scope for the display of his satiric genius, and from that time forth he has continued to pursue with remarkable success this his true vein. His illustrations for Mr William Hone's political squibs and pamphlets attracted much attention, and sent some of them through no less than fifty editions. But these political caricatures, many of which were personal, were not altogether to C.'s taste. Nor, indeed, in this narrow party field did he find verge enough for the full exhibition of his rich fund of humour and depth of moral sarcasm. He consequently abandoned this style about 1824. In *Points of Humour*, and the designs for *Grimm's German Tales*, *Tom Thumb*, *Peter Schlemihl*, *Punch and Judy*, *My Sketch-book*, *Boz*, *Oliver Twist*, and the *Comic Almanac*, his comic genius first found ample manifestation; while in his *Sunday in London*, his *Gin-shop*, *The Upas Tree*, and especially *The Bottle*, he shewed himself a moral teacher possessed of a grim Hogarthian earnestness and force. *The Bottle* consisted of a series of eight large-sized plates representing the various stages in a drunkard's career; and through the instrumentality of the temperance societies, as well as on account of its own merits, the work has had an enormous circulation. Latterly, C. has devoted himself to oil-painting; and in his pictures, 'Dressing for the Day,' 'A Runaway Knock,' 'Tam O'Shanter,' and 'Disturbing the Congregation,' he combines humour and artistic skill. It is pleasant to add regarding a man of true genius, that his personal character has gained for him the respect and affection of all who know him—'in wit a man, simplicity a child.'

**CRUI'SER** is a small war-vessel, employed chiefly in watching an enemy by sailing about in a suspected latitude, or in any other defined portion of sea.

**CRUITHNE'** (Lat. *Cruithnii*, *Cruthini*), the name given, from the 6th to the 9th c., to a people who inhabited the southern half of the county of Antrim, and the greater part of the county of Down, and at one time established themselves also in the county of Meath, in Ireland. They were otherwise called Dalaradians, and their country, Dalaradia. Their name of C. is supposed to be derived from the Celtic *cruit*, colour, and to have been applied to them because they painted or tattooed their skins. It is the name by which the Irish called the Picts of Britain, of whom, indeed, the Irish C. are believed to have been a branch. See DALARADIA and PICTS.

**CRUIVES AND ZAIRES** are contrivances erected upon rivers in Scotland for the purpose of catching salmon. They are of great antiquity, and consisted of a 'kind of hedge formed by stakes driven into the ground, the interstices being filled with brush, and the mode of capturing salmon being similar to those employed by bag and stake nets;' the earliest statute now in force, the 11th of the first parliament of James I. (1424), being entitled, 'Of Cruives, Zaires, and Satterdaies Slop.' This act is interpreted by 1477, c. 73, 'Anent cruives,' and both acts refer to an 'old statute made by King David,' requiring that 'ilk heck of the foresaidis cruves be three inch wide.' The existing arrangement, by which the stakes or hecks which prevent the passage of the larger fish must be so far apart as to permit the young salmon or fry to pass through freely, is thus as old as the time of the great founder of our Scottish monasteries and cathedrals. The Saturday's slop or opening is effected by drawing up the hecks to the height of an ell from the bottom of the river, in which position they must remain from Saturday evening at sunset till Monday morning at sunrise. C. and Z. are prohibited in those parts of a river in which the tide ebbs and flows, and it is proposed to abolish them entirely by a bill now (1861) before parliament. See SALMON-FISHING, STAKE-NETS.

**CRUSA'DES** is the name given to the religious wars carried on during the middle ages between the Christian nations of the West and the Mohammedans. The first of these was undertaken simply to vindicate the *right* of Christian pilgrims to visit the Holy Sepulchre. On the conquest of Palestine, however, the *object* of the C. changed, or at least enlarged, and the efforts of the subsequent crusaders were directed to the rescue of the whole land from the Saracens, who had repossessed themselves of it. From an early period in the history of the Church, it was considered a pious act to make a pilgrimage to the Holy Sepulchre, and to visit the various spots which the Saviour had consecrated by his presence. When Palestine was conquered by the Arabs in the 7th c., that fierce but generous people respected the religious spirit of the pilgrims, and allowed them to build a church and a hospital in Jerusalem. Under the Fatimides of Egypt, who conquered Syria about 980 A.D., the position both of the native Christian residents and of the pilgrims became less favourable; but the subjugation of the country, in 1065, by brutal hordes of Seljuk Turks from the Caucasus rendered it intolerable. These barbarians, but recently converted to Mohammedanism, were nearly as ignorant of the Koran as of the Scriptures. They hardly knew their fellow-religionists, and are said to have wreaked their vengeance on the Mussulmans of Syria, as well as on the Christians. The news of their atrocities produced a deep sensation over the whole of Christendom. The first to take alarm were, naturally enough, the Byzantine monarchs. In 1073, the Greek emperor, Manuel VII., sent to supplicate the assistance of the great pope, Gregory VII., against the Turks, accompanying his petition with many expressions of profound respect for his Holiness and the Latin Church. Gregory—who beheld in the supplication of Manuel a grand opportunity for realising the Catholic unity of Christendom—cordially responded; but circumstances prevented him from ever carrying the vast designs which he entertained into execution, and the idea of a crusade died gradually away. It was, however, revived by his successor, Urban II., an able and humane man, whose sympathies were kindled by the burning zeal of Peter the Hermit, a native of Amiens, in France, who had made a pilgrimage to the Holy Land, witnessed the cruelties perpetrated by the Turks, and was now traversing Europe, preaching everywhere to crowds in the open air, and producing the most extraordinary enthusiasm by his impassioned descriptions of how pilgrims were murdered, robbed, or beaten, how shrines and holy places were desecrated, and how nothing but greed restrained the ruffian Turks (who made the Christians pay heavy taxes for their visits to Jerusalem) from destroying the Holy Sepulchre, and extirpating every vestige of Christianity in the land. As soon as the feelings of Europe had been sufficiently heated, Urban openly took up the question. Two councils were held in 1095. At the second, held at Clermont, in France, a crusade was definitely resolved on. The pope himself delivered a stirring address to a vast multitude of clergy and laymen, and as he proceeded, the pent-up emotions of the crowd burst forth, and cries of *Deus vult* (God wills it) rose simultaneously from the whole audience. These words, *Deus vult*, by the injunction of Urban, were made the war-cry of the enterprise, and every one that embarked in it wore, as a badge, the sign of the cross; hence the name *Crusade* (Fr. *croisade*, from Lat. *crux*, a cross).

*First Crusade.*—From all parts of Europe, thousands upon thousands hurried at the summons of the pope to engage in the holy war. 'The most distant islands and savage countries,' says William of Malmesbury, 'were inspired with this ardent passion. The Welshman left his hunting, the Scotchman his fellowship with vermin, the Dane his drinking-party, the Norwegian his raw fish.' It is said that in the spring of 1096 not less than 6,000,000 souls were in motion towards Palestine. This, however, must be a huge exaggeration. What we do know positively is, that previous to the setting out of the great hosts of European chivalry, four armies—if disorderly and anarchic multitudes, the mere dregs and refuse of Christendom, deserve that name—amounting in all to 275,000 persons, had departed for Palestine. The first consisted of 20,000 foot, and was commanded by a Burgundian gentleman, Walter the Pennyless. It marched through Hungary, but was cut to pieces by the natives of Bulgaria, only a few, among whom was Walter himself, escaping to Constantinople. The second, consisting of 40,000 men, women, and children, was led by Peter the Hermit. It followed the same route as its predecessor, and reached Constantinople greatly reduced. Here the two united, crossed the Bosporus, and were utterly defeated by the Turks at Nice, the capital of Bithynia. A third expedition of a similar kind, composed of 15,000 Germans, led by a priest named Gottschalk, was slaughtered or dispersed in Hungary; which also proved the grave of the *fourth*, a terrible horde, consisting of about 200,000 wretches from France, England, Flanders, and Lorraine, who had swept along through Germany, committing horrible ravages, especially against the Jews, whom they murdered without mercy. *Now*, however, the real crusaders made their appearance: the gentry, the yeomanry, and the serfs of feudal Europe, under chiefs of the first rank and renown. Six armies appeared in the field, marching separately, and at considerable intervals of time. Their respective leaders were Godfrey of Bouillon, Duke of Lorraine; Hugh the Great, Count of Vermandois, and brother of Philippe, king of France; Robert Curthose, Duke of Normandy, the son of William the Conqueror; Count Robert of Flanders; Bohemond, Prince of Tarentum, son of the famous Guiscard, under whom was Tancred, the favourite hero of all the historians of the crusade; and lastly, Count Raymond of Toulouse. The place of rendezvous was Constantinople. The Greek emperor, Alexius, afraid that so magnificent a host—there were in all not less than 600,000 men, exclusive of women and priests—might be induced to conquer lands for *themselves*, cajoled all the leaders, excepting Tancred and Count Raymond—into solemnly acknowledging themselves his liegemen. After some time spent in feasting, the crusaders crossed into Asia Minor (accompanied by the unfortunate Peter the Hermit). Here their first step was the siege and capture of Nice, the capital of Sultan Soliman, 24th June 1097. This monarch was also defeated by Bohemond, Tancred, and Godfrey, at Dorylæum. Baldwin, brother of Godfrey, now crossed into Mesopotamia, where he obtained the principality of Edessa. After some time, the crusaders reached Syria, and laid siege to Antioch. For seven months the city held out, and the ranks of the besiegers were fearfully thinned by famine and disease. Many even brave warriors lost heart, and began to desert. Melancholy to relate, among the list of cowards was the poor enthusiast who had planned the enterprise. Peter was actually several miles on his way home when he was overtaken by the soldiers of Tancred, and brought back to undergo a public reprimand. At length, on the 3d of June 1098, Antioch was taken, and the inhabitants were massacred by the infuriated crusaders, who were in their turn besieged by an army of 200,000 Mohammedans sent by the Persian sultan. Once more famine and pestilence did their deadly work. Multitudes also deserted, and escaping over the walls, carried the news of the sad condition of the Christians back to Europe But again victory crowned the efforts of the besieged. On the 28th June 1098, the Mohammedans were utterly routed, and the way to Jerusalem opened. It was on a bright summer morning (1099) that 40,000 crusaders, the miserable remnant of that vast array which two years before had laid siege to Nice, obtained their first glimpse of Jerusalem. The emotion was intense, the scene sublime. On the 15th of July, after a siege of rather more than five weeks, the grand object of the expedition was realised. Jerusalem was delivered from the hands of the infidel. Eight days after the capture of the city, Godfrey of Bouillon was unanimously elected king of Jerusalem. His kingdom, at first comprising little more than the mere city of Jerusalem, was gradually extended by conquest until it included the whole of Palestine. A language resembling Norman French was established, a code of feudal laws drawn up—Jerusalem was erected into a patriarchate, and Bethlehem into a bishopric. The best part of Asia Minor was restored to the Greek empire, while Bohemond became Prince of Antioch. For nearly fifty years, the three Latin principalities or kingdoms of the East—Edessa, Antioch, and Jerusalem—not only maintained themselves against the attacks of the Mohammedans of Egypt and Syria, but greatly increased in size, power, and wealth. At Jerusalem were founded the two famous orders of the Knights Hospitallers of St John and the Knights Templars.

*Second Crusade.*—In 1144, the principality of Edessa was conquered by the Emir of Mosul, and the Christians slaughtered. His son, Noureddin, advanced to destroy the Latin kingdoms of Syria and Palestine. Europe once more trembled with excitement. A second crusade was preached by the famous St Bernard, Abbot of Clairvaux, in Champagne; and early in 1147 two enormous armies, under the command of Louis VII., king of France, and Conrad III., emperor of Germany, marched for the Holy Land. Their united numbers were estimated at 1,200,000 fighting-men. The expedition, nevertheless, proved a total failure. The Greek emperor, Manuel Comnenus, was hostile; and through the treachery of his emissaries, the army of Conrad was all but destroyed by the Turks near Iconium, while that of Louis was wrecked in the defiles of the Pisidian mountains. After a vain attempt to reduce Damascus, the relics of this mighty host returned to Europe.

*Third Crusade.*—The death-blow, however, to the kingdom of Jerusalem, and the power of the crusaders, was given, not by Noureddin, but by Salah-Eddin, commonly called Saladin, a young Kurdish chief, who had made himself sultan of Egypt, and who aspired to the presidency of the Mohammedan world. He invaded Palestine, took town after town, and finally, in October 1187, compelled Jerusalem itself to capitulate, after a siege of fourteen days. The news of this led to a third crusade, the chiefs of which were Frederick I. (Barbarossa), emperor of Germany, Philippe Auguste, king of France, and Richard *Cœur-de-Lion*, king of England. Barbarossa took the field first in the spring of 1189, but accidentally lost his life by fever caught from bathing in the Orontes. His army, much reduced, joined the forces of the other two monarchs before Acre, which important city was immediately besieged. In vain did Saladin attempt to relieve the defenders; and after a beleaguerment of twenty-three months, the place surrendered. But the crusaders were not united among themselves. Philippe soon after returned to France; and Richard, after accomplishing prodigies of valour, which excited the admiration of the Saracens, concluded a treaty with Saladin, by which 'the people of the West were to be at liberty to make pilgrimages to Jerusalem, exempt from the taxes which the Saracen princes had in former times imposed.' This, as has been previously noticed, was *all* that had been claimed by the *first* crusaders. On the 25th of October 1192, Richard set sail for Europe.

*Fourth Crusade.*—Crusading unfortunately now became a constituent of the papal policy; and in 1203 a fourth expedition was determined upon by Pope Innocent III., although the condition of the Christians was by no means such as to call for it. It assembled at Venice; but how entirely secular crusading had become, will be seen from the fact, that the army never went to Palestine at all, but preferred to take possession of the Byzantine empire. The leader of this host of *pseudo-crusaders*, Baldwin, Count of Flanders, was seated on the throne of the East in 1204, where he and his successors maintained themselves for fifty-six years.

*Fifth Crusade.*—This was commanded by Frederick II., emperor of Germany. It began in 1228, and terminated in a treaty between that monarch and the sultan of Egypt, by which Palestine was ceded to Frederick, who, after being crowned king of Jerusalem, returned to Europe, leaving his new possessions in a state of tranquillity.

*Sixth Crusade.*—In 1244, a new race of Turks burst into Syria, and once more the Holy Land fell into the hands of these ferocious barbarians. Jerusalem was burned and pillaged. In 1249, Louis IX. of France (St Louis) headed a crusade against them, but was utterly defeated, and taken prisoner by the sultan of Egypt. By the payment of a large ransom he obtained his liberty, and that of the other prisoners. On his return to Europe, he was regarded as a sort of martyr in the cause of Christ.

*Seventh Crusade.*—This also was primarily undertaken by St Louis, but he having died at Tunis in 1270, on his way to Palestine, Prince Edward of England, afterwards Edward I., who had originally intended to place himself under the command of St Louis, marched direct for Palestine, where his rank and reputation in arms gathered round him all who were willing to fight for the cross. Nothing of consequence, however, was accomplished; and Edward soon returned to England, the last of the crusaders. Acre, Antioch, and Tripoli still continued in the possession of the Christians, and were defended for some time by the Templars and other military knights; but in 1291 Acre capitulated, the other towns soon followed its example, and the knights were glad to quit the country, and disperse themselves over Europe in quest of new employment, leaving Palestine in the undisturbed possession of the Saracens.

*Effects of the Crusades.*—While we cannot help deploring the enormous expenditure of human life which the C. occasioned, it is impossible to overlook the fact that they indirectly exercised a most beneficial influence on modern society. They secured for humanity certain advantages which it is difficult to see could have been otherwise obtained. M. Guizot, in his *Lectures on European Civilisation*, endeavours to shew their design and function in the destinies of Christendom. 'To the first chroniclers,' he says, 'and consequently to the first crusaders, of whom they are but the expression, Mohammedans are objects only of hatred: it is evident that those who speak of them do not know them. The historians of the later crusades speak quite differently: it is clear that they look upon them no longer as monsters; that they have to a certain extent entered into their ideas; that they have lived with them; and that relations, and even a sort of sympathy, have been established between them.' Thus the minds of both, but particularly of the crusaders, were partly delivered from those prejudices which are the offspring of ignorance. 'A step was taken towards the enfranchisement of the human mind.' Secondly, the crusaders were brought into contact with two civilisations, richer and more advanced than their own—the Greek and the Saracenic; and it is beyond all question that they were mightily struck with the wealth and comparative refinement of the East. Thirdly, the close relationship between the chief laymen of the West and the church, occasioned by the C., enabled the former 'to inspect more narrowly the policy and motives of the papal court.' The result was very disastrous to that spirit of veneration and belief on which the church lives, and in many cases an extraordinary freedom of judgment and hardihood of opinion were induced—such as Europe had never before dreamed of. Fourthly, great social changes were brought about. A commerce between the East and West sprang up, and towns—the early homes of liberty in Europe—began to grow great and powerful. The C., indeed, 'gave maritime commerce the strongest impulse it had ever received.' The united effect of these things, again, in predisposing the minds of men for a reformation in religion, has often been noticed. Other causes undoubtedly co-operated, and in a more direct and decisive manner, but the influence of the C. in procuring an audience for Luther, cannot be overlooked by the philosophic historian.

**CRUSCA**, Academia della. See Academy.

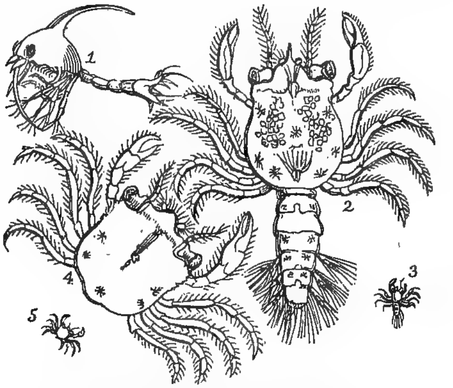
**CRUSHERS**, or **BRUISERS**, are implements used for reducing to small fragments corn, beans, linseed, oil-cake, and other similar hard food of horses, oxen, or hogs, in order that it may be more thoroughly subjected to the action of the gastric juice, and that no part of it may pass through the animal undigested. Seeds which enter the stomach with their husk or outer pellicle unbroken, often resist its powers, so that they contribute nothing to nourishment; and this is the case to a very large extent with corn given to old horses; but mastication is never so perfect, however good may be the condition of an animal's teeth, that the previous crushing of hard food will not be found useful. C. are of different kinds, and those intended for oil-cake are somewhat different from those suitable for grain; but the essential part generally consists of toothed, grooved, or otherwise roughened cylinders, revolving so as to bruise the food either against each other, or against a fixed plate of similar roughness.—Clod-crusher is the name of an agricultural implement, which may be generally described as a toothed or roughened roller; and will be found noticed, with its uses, in the article Roller.

**CRUST OF THE EARTH.** It being generally believed by geologists that the interior of our globe is in a state of fusion from heat, they have given the name of crust of the earth to the external solid covering. Man has been able to penetrate but a short way into the crust, and he cannot safely reason on his observations made at or near the surface, regarding the condition of the crust to a greater depth than a few miles, at the most ten—all beyond is little more than guess-work. The materials of the crust are not thrown confusedly together, but distinct mineral masses are found to occupy definite spaces, or to exhibit a certain order of arrangement. All these may be classified in reference either to their origin, which is Aqueous (see Aqueous Rocks) or Igneous (q. v.); or to their relative age, as Primary (q. v.), Secondary (q. v.), and Tertiary (q. v.).

**CRUSTA'CEANS** (*Crustacea*), a class of articulated animals, agreeing with insects, arachnida, and myriapoda in having articulated limbs; but differing from them in important respects, and particularly from all of them in the adaptation of the organs of respiration to an aquatic life, even those of them which live on land being generally inhabitants of damp places, and breathing by a kind of gills. Some of the lowest and minute aquatic C., indeed, are not provided with gills; but the aëration of the blood is supposed to take place through the surface of the body.

The C. derive their name from the hard armour which in most of them covers the whole body, forming for it that sort of framework which is sometimes, not very correctly, called an external skeleton; and which, in those of highest organisation, is very complex in its structure, and contains a large amount of calcareous matter—carbonate and phosphate of lime, so that it is in its substance intermediate between shell and bone—whilst in many of the lower and smaller kinds it consists principally of *chitine*, and corresponds more nearly in its nature with the integuments of insects. The body of a crustacean is composed of rings (see Articulata), generally twenty-one in number, and the crustaceous covering corresponds with it in this respect; the rings, alike of the body and its armour, being in some cases very distinct, whilst in others some of them in a great measure coalesce or are consolidated together, of which the thorax of a crab affords an excellent example. The first seven rings are regarded as forming the head; the next seven, the thorax; and the remainder the abdomen, corresponding with the head, thorax, and abdomen of insects. The crustaceous covering is considered as a peculiar epidermis, having beneath it a true skin, from which it is an inorganic exudation; and, like the epidermis, it is cast off from time to time, that its place may be supplied anew, as the growth of the animal requires more room for the internal soft parts. In this *moulting*, or casting of the shell, the animal divests itself of its covering not in separate parts, but in one piece, including the coverings of the limbs, and even of the antennæ, although the membranes which connect the hard plates are split and torn. A period of apparent sickness precedes and agitation accompanies the process; and the thick muscular parts of the limbs of crabs and lobsters become soft and flaccid, so as to be much more easily extricated from their hard coverings. The loss of a limb, which sometimes takes place on such an occasion, and is otherwise a frequent occurrence, is easily repaired, for a new one grows in its stead; but it is a curious circumstance that in order to this reproduction, the limb must be broken off at a particular joint, the second from the body, thus leaving only a short stump; and when a limb is broken elsewhere, the animal itself exercises the remarkable power of throwing it off by this joint.

The principal organ of locomotion in many C., as in the lobster, shrimp, &c., is the abdomen, terminating in fan-like appendages; by bending the abdomen suddenly down under the thorax, they dart *backwards* in the water. The limbs—which are connected with the thoracic rings—are, in some, organs of swimming; those of others are used for walking at the bottom of the water or on dry ground. Some have what are called *false legs* or *pro-legs* attached to the abdomen, often very different from the thoracic legs. The legs of some are fitted for burrowing. The first pair of legs is not unfrequently transformed into a pair of powerful claws or pincers—the last joint but one being prolonged so as to oppose the last joint, which becomes attached as to the side of it; and these are used for seizing and tearing food. The limbs of the first thoracic rings are, in many C., organs still more intimately connected with the mouth, and have received the name of foot-jaws, the transition from the true mandibles and maxillæ to the organs of locomotion being often very gradual. The mouth of some small parasitic C. is, however, formed for sucking, and not for tearing and masticating food. The digestive organs are very simple in all; there is a short but capacious gullet, a large stomach, and a straight and simple intestinal tube. The pyloric region of the stomach, however, is furnished with a remarkable apparatus of hard tubercles or sharp teeth for grinding or tearing food, supplementary to the external organs of the mouth. Almost all of the C. feed on animal food, and they are very voracious. A few feed on vegetable food. The nervous system of C. agrees generally with that of insects, and exhibits many gradations of division and concentration. C., in general, appear to possess all the five senses. Their eyes are either simple (stemmatic), aggregate (consisting of several stemmata under a common cornea), or compound. The compound eyes are often on foot-stalks. The gills are variously placed; in the internal cavity, under the *carapace*—the enlargement of the plate of a single ring, which covers the thoracic rings in crabs, &c.; on the thoracic limbs; on the abdominal or false legs, &c. The heart is always in the middle line of the body, is of various form, and distributes the blood by a number of trunks through the system; but the blood returns to venous *sinuses*, from which, and not from the heart, it is sent into the gills, and it is not until after its aëration in the gills that it comes to the heart again; not, however, without being mixed with venous blood which has not undergone the same aëration. The sexes are distinct in most of the C.; and they are all oviparous. A sort of incubation of the eggs takes place, in order to which they are carried under the abdomen or under the thorax of the female, attached to the false legs or to some of the thoracic appendages. It has recently been discovered, contrary to former belief, that C.—or at least many of them—undergo metamorphoses; and the curious creatures known by the name *Zoea* have been found to be the young of crabs.



Transformations of the Crab:
1, young crab, or *zoea*, magnified; 2, young crab, in a more advanced stage, magnified; 3, young crab, in a more advanced stage, natural size; 4, young crab, when it has assumed its more perfect form, magnified; 5, young crab, when it has assumed its more perfect form, natural size.

The greater number of C. are marine: some inhabit fresh waters, running or stagnant; comparatively few are terrestrial.

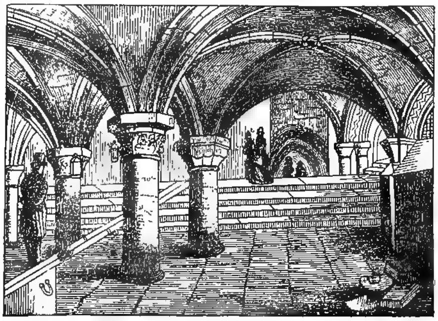
Cuvier divided C. into two sections, *Malacostraca* and *Entomostraca:* the former section containing the orders *Decapoda*, *Stomapoda*, *Læmodipoda*, *Amphipoda*, and *Isopoda;* the latter the *Branchiopoda* and *Pœcilopoda*. Another division has been more recently proposed by Milne Edwards, and very generally adopted into *Xyphosura* (the genus *Limulus* alone), having a mouth destitute of jaws, and for which legs perform the office of jaws; *Maxillosa*, or Masticating C.; and *Edentata*, or Suctorial Crustaceans.

**CRUYS**, Cornelis, the founder of Russian maritime power, was born June 14, 1657. He was a rear-admiral in the Dutch service when Czar Peter the Great, noticing his abilities, persuaded him to go to Moscow. There he arrived October 15, 1698, was received with great splendour, and soon appointed vice-admiral. His services to Russia were of various kinds: to him it owed its first dockyards, canals, and charts, the organisation of its navy, and its victories over Sweden and Turkey in 1708—1710. After a short period of disgrace, C. was received back to favour. He died in 1727, possessor of an imperial domain in Kexholm, and owner of the island Birken in Finland. It is in memory of him the white flag with the blue cross (Dutch, *kruis*) still floats from the Russian men-of-war.

**CRY'OLITE** is a double fluoride of aluminium and sodium ($NaF,Al_2F_3$), and is important as a source of the metal Aluminium (q. v.).

**CRYO'PHORUS** (Gr. *kryos*, cold, and *phero*, I carry) is an instrument consisting of a glass tube with a bulb at both ends. A little water is present in one of the bulbs, and when the second bulb, containing only water-vapour, is placed in a freezing mixture, the vapour condenses, which causes more vapour to rise from the water in the first bulb. The result of this vaporation from the first bulb is the abstraction of much heat, and ultimately the remaining water passes into a frozen state.

**CRYPT** (Gr. *krypto*, I hide), a vault under a church, either entirely or partly under ground. Crypts do not generally extend beyond the limits of the choir or chancel, and they are often of much smaller dimensions. Crypts were formerly used as chapels, and provided with altars and the other furniture requisite for the celebration of religious services; and they were also very frequently used as places of sepulture. It sometimes happens that a new church has been erected over the C. belonging to the old one. One of the largest crypts in England is that under Canterbury Cathedral; but there are few finer specimens of the C. anywhere than that under Glasgow Cathedral, which has been recently freed from rubbish and restored. Crypts seem to have originated in the customs of the early Christian ages. The tombs of the martyrs were first used as churches; and then churches were built above them.



Crypt of York Cathedral.

**CRYPTO'GAMOUS PLANTS** (Gr. *kryptos*, concealed, and *gamē*, marriage) are those which have no true flowers, and no known male or female organs of fructification, and whose seeds, called *spores*, consist only of a single cell, and contain no embryo, but germinate indifferently from any point; and which Jussieu therefore designated *Acotyledonous Plants* (q. v.). The name C. P. was invented by Linnæus, and the *Cryptogamia* form a class of his sexual system, very distinct from all the rest. See BOTANY. Many C. P. have no leaves; some have not even a root, and those which are lowest in organisation consist only of a single cell. Many are parasitic. Many look as if dead in a dry atmosphere, and are revivified by rain. They are the lowest in organisation of the vegetable kingdom, and are divided into *Filices* (Ferns), *Marsileaceæ*, *Lycopodiaceæ* (Club-mosses), *Equisetaceæ* (Horse-tails), *Musci* (Mosses), *Hepaticæ*, *Lichens*, *Fungi*, *Characeæ*, and *Algæ*.

**CRYPTO'GRAPHY**, the art of secret writing, more commonly called the art of writing in cipher (from Arabic *sifr*, void), has been in use from an early date in correspondence between diplomatists and others engaged in important affairs requiring secrecy. In modern times, it has been the subject of learned care to Lord Bacon, the ingenious Marquis of Worcester, Dr Wallis, Bishop Wilkins, Thicknesse, Falconer, Blair, &c. In our own history, it has at no time been in greater requisition than during the civil war, and among the politicians of the 17th century. And even now, when there is happily less need for mystery among our statesmen, the need for a perfectly undecipherable mode of secret communication has again had to be looked for, in order that information may pass by the electric telegraph without being understood by the officials in connection with the apparatus.

One of the most simple methods of C. is to use, instead of each letter of the alphabet, a certain other letter at a regular interval in advance of it in that series. Such was a mode of secret writing used by Julius Cæsar. As a variety upon this plan, the alphabet is used invertedly—*z* for *a*, *y* for *b*, *x* for *c*, and so on. Or, while the first seven letters are represented by the second seven, the next six may be represented by the last six. And many other variations may be adopted. But for all modes like these, there are modes of decipherment far from difficult. It is only necessary, in general, to bear in mind certain peculiarities of the language presumed to be used. Say it is the English. We readily remember that *e* is the most frequent letter; that *ea* and *ou* are the double vowels which most frequently occur; that the consonants most common at the ends of words are *r*, *s*, and *t*; &c. We also know how a single letter must be either the pronoun *I* or the article *a*; how *an*, *at*, and *on*, are the most common words in two letters; how *the* and *and* are the most frequent words in three letters; &c. By taking advantage of these few obvious principles, a tolerably skilled decipherer will read almost any such piece of cryptographic writing in five minutes. The *Times* newspaper often gives, in its advertising columns, correspondence on delicate subjects, even assignations for elopements, written in this manner, the writers of which are of course little aware how open their secrets thus become to society.

Politicians and important personages conducting affairs of difficulty became long ago sensible of the necessity of using ciphers of greater abstruseness. The celebrated letter of Charles I. to the Earl of Glamorgan, in which he made some condemning concessions (elsewhere denied) to the Catholics of Ireland, was composed in an alphabet of 24 short strokes variously situated upon a line. Other letters by the same monarch are to appearance a mere series of numbers of two and three figures, divided by semicolons. In such cases, it was necessary that the two parties in the correspondence should have previously concerted what words each number was to represent. Bacon devised what he thought a not easily penetrable cipher, in which he employed only *a* and *b*, arranging each of these, in groups of five, in such collocations as to represent all the 24 letters. Thus, *aabab ababa babba* conveyed the word *Fly*. The great philosopher thought that preconcertment would here be necessary; but in reality any clever modern decipherer would have found no difficulty in reading any long letter composed in such a manner. The unfortunate Earl of Argyle, when preparing his expedition against the tyrannical government of James II., used a mode of secret writing which consisted in setting down the words at certain intervals, which he afterwards filled up with other words, making on the whole something intelligible, but indifferent. In our day, such a mode would not have been found proof against the ingenuity of those who have studied the means of decipherment.

There are many other modes of secret writing, which it does not seem necessary to detail, as the art has become little more than a matter of curiosity. One of the ablest and amplest treatments of the subject is an article by Dr William Blair in *Rees's Cyclopædia.* See also *Chambers's Journal,* No. 506 (Second Series), under 'Secrets Exposed,' and Nos. 87 and 115, under 'Cryptographs.'

**CRY'STAL ISLANDS.** See Coral Islands.

**CRY'STALLINE ROCKS,** a name given to all rocks having a crystalline structure. They are found belonging to every division of the crust of the earth, but are especially abundant in the most ancient azoic rocks; the greater proportion of intruded igneous rocks also possess this structure. When attempting in the laboratory to produce crystals, it is known that the building material must exist in a fluid condition, and this is obtained either by heating to fusion or by solution. It has been asserted that all C. R. have been produced under similar circumstances; and no one can doubt that lavas and more ancient rocks having a similar origin, have assumed this structure while solidifying from a condition of igneous fusion, while rock-salt is as certainly obtained from a saturated solution of salt. There are, however, many rocks, such as some fossiliferous limestones, in which this structure occurs, where it is not possible to conceive of their being in either condition. It is known that crystallisation takes place in solid material, as in the axles of railway carriages, or in the crystals of pyrites in the chalk, where the iron has been gathered from the surrounding material while in a solid state. We know not what is the force that induces such a change in solid materials: it may be called metamorphic or molecular action, but these are names that mean nothing, and simply hide our ignorance. That such a force, inducing crystalline structure in amorphous masses, has been and is now at work on the solid strata of the earth, cannot be doubted.

**CRYSTALLO'GRAPHY.** A crystal is a piece of matter that, by the action of molecular forces, has assumed a definite geometrical form of some kind, with plane faces. There is a great variety of crystalline forms, each form being characteristic of one or more substances; and C. is the science which classifies the forms and shews the relations that subsist among them. The great majority of substances are capable of undergoing the process of crystallisation, the exceptions being principally complex organic substances which tend to assume a globular or spherical form approaching that of organised structures. The most favourable condition for the crystallisation of any substance is from its solution in water or other liquid. A liquid usually dissolves more of a salt when warm than when cold; and when a warm saturated solution is allowed to cool, a portion of the salt deposits itself in crystals. This process is that which is generally followed in the crystallisation of saline substances. A second process resorted to in the case of the metals, such as bismuth, antimony, &c., and sulphur, is to fuse the material in a vessel, and when it is cooled down, so as partially to solidify the mass, the crust is broken through, and the liquid still remaining is poured off, when a net-work of crystals is obtained. A third method is to vaporise the substance, which on condensation resolves itself into crystals. Examples of this class are the formation of snow crystals from the water-vapour in the atmosphere, and the minute black crystals of iodine obtained by allowing its vapour to condense in a cold vessel—or on a cold surface.

Many circumstances affect the crystallising power of substances. Thus, water may be cooled down below its freezing or crystallising point (32° F.), provided it be kept perfectly still, without becoming solid; but on subsequent agitation, it instantly crystallises. Similarly, a hot saturated solution of sulphate of soda, or glauber salt, if cooled down in a still place, does not crystallise, but immediately does so when the liquid is agitated, or a fragment of any solid substance is introduced into it. The size of the crystals obtainable from any fluid depends much on the rate of cooling, and the state of commotion of the liquid. The more slowly the solution cools down, and the more quietly the process of crystallisation is allowed to proceed, the larger are the crystals obtained; whilst, when the liquid is rapidly cooled, and agitation is kept up, the crystals are comparatively small, and generally not completely formed. The reason of this will be at once apparent, for a large crystal is constructed of a multitude of smaller crystals, built up regularly so as to constitute a compound crystal of the same form as the more minute crystalline atoms; and when a liquid is cooled slowly in a state of rest, only a few minute crystals are produced at first, and these are gradually built round on all sides by successive layers, till large, well-defined crystals are the result; while, when the liquid is rapidly lowered in temperature, and especially when agitation is kept up, numerous minute crystals are formed at once, and do not adhere together. In either case, the liquid from which the crystals have separated is called the *mother-liquor,* and is a saturated solution of the salt.

The external forms of crystals amount to several thousands, but they may all be regarded as belonging to six different systems.

The *regular system* (otherwise called the *cubic, octohedral, tesseral, tessular, spheroidal,* or *equi-axed system*) is characterised by having three axes or straight lines passing through the same point, of equal lengths, and placed at right angles to each other. The best illustration of this system is the cube or hexahedron (fig. 1), which has six square faces or planes, and the three equal axes (printed in bold lines) terminate in the centre of each of the square faces. The planes or squares are symmetrically arranged, so that each is perpendicular to one axis, and parallel to the other two. The crystals have each six square faces, with twelve equal edges, and eight equal angles. Examples of substance which crystallise in the form of the cube or hexahedron, are—common iron pyrites ($FeS_2$), common salt, or the chloride of sodium ($NaCl$), fluor spar ($CaF$), galena, or the sulphuret of lead ($PbS$), and the metals gold, silver, platinum, and copper. Another important crystalline form belonging to the regular system is the octohedron (fig. 2), where the terminations of the axes are in the angles of the crystals, as represented in the figure by the bold lines. It has eight faces, all of which are equilateral triangles, and twelve edges, with six angles, each of which has four faces. The diamond ($C$), alum, zinc-blende ($ZnS$), sal ammonia C. ($NH_4Cl$), magnetic iron ore ($Fe_3O_4$), fluor spar ($CaF$), and

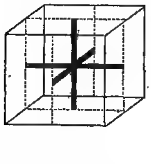


Fig. 1.

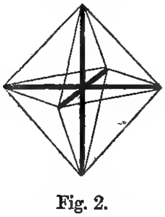


Fig. 2.

chrome iron ore, are examples. There are various secondary forms belonging to this system, derivable from the cube and octohedron, such as the rhombic dodecahedron (fig. 3), which has twelve faces, and is the form in which the garnet crystallises.

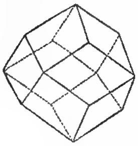


Fig. 3.

The *square prismatic system* (known as the *pyramidal, tetragonal,* or *quadratic system*) has three axes placed at right angles to each other, of which two are of equal length, but the third may be longer or shorter. To this belong the *right square prism* (fig. 4), in which the lateral axes terminate in the centre of each side face, and the perpendicular axis, is longer than the two lateral axes; and the *right square-based octohedron* (fig. 5), which resembles two pyramids placed base to base, and having eight faces, which form isosceles triangles. Examples of substances which crystallise in this system are—yellow prussiate of potash, native binoxide of tin, zircon, apophylite, calomel, &c.

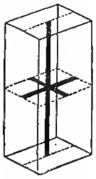


Fig. 4.

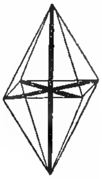


Fig. 5.

The *right prismatic system* (otherwise known as the *right rhomboidal,* or *rectangular prismatic system*) is characterised by having three axes, all of unequal or different lengths, but placed at right angles to each other. The *right rhombic prism* (fig. 6), and the right *rhombic-based octohedron* (fig. 7), are forms included in this class, and examples of materials which crystallise in this form are—sulphur, arsenical iron pyrites, nitrate of potash, sulphate of potash, sulphate of baryta (heavy spar), topaz, arragonite, &c.

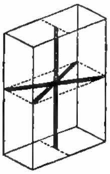


Fig. 6.

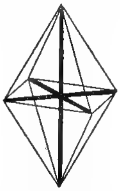


Fig. 7.

The *oblique prismatic system* (*oblique rhomboidal,* or *rectangular prismatic*) has three axes, which may be all of unequal lengths, two of which are placed at right angles to each other, whilst the third axis is so inclined as to be perpendicular to one of the two axes, and oblique to the other. To this belong the *oblique rhombic prism* (fig. 8), and the *oblique rhombic-based octohedron* (fig. 9). Many salts crystallise in this form, such as green vitriol (sulphate of iron), borax, sulphate of soda, carbonate of soda, phosphate of soda, realgar (native bisulphuret of arsenic), &c.

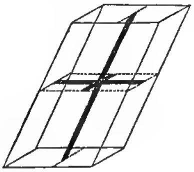


Fig. 8.

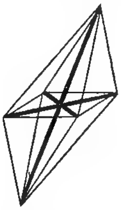


Fig. 9.

The *doubly oblique prismatic system* has three axes of unequal length, which intersect obliquely with each other. The forms are very irregular, which render them very puzzling to make out satisfactorily. Nitrate of bismuth, sulphate of copper, sulphate of manganese, quadroxalate of potash, and pyrotartaric acid, are examples.

The *rhombohedral,* or the regular *hexagonal system,* is known by the presence of four axes, three of which are in the same plane, and inclined to each other at an angle of 60°, whilst the remaining fourth axis is perpendicular to the three. To this belong the *regular six-sided prism* (fig. 10), and the *rhombohedron* (fig. 11). Examples of this system are—calcareous spar, ice, quartz or rock crystal, nitrate of soda, beryl, arsenic, antimony, and apatite.

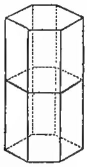


Fig. 10.

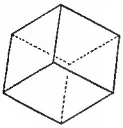


Fig. 11.

**CRYSTALLO'MANCY**, a mode of divination by means of transparent bodies, at one time very popular. A precious stone, crystal globe, or other transparent object, was employed, but a beryl was deemed most effective. In using it, the operator first muttered over it certain formulas of prayer, and then gave it into the hands of a youth or virgin—none others were pure enough to discern its revelations—who beheld in it the information required. Sometimes the desiderated facts were conveyed by means of written characters on the crystal; sometimes the spirits invoked appeared in the crystal to answer the questions asked.

**CSA'BA**, a town of Hungary, 7 miles south-south-west of Bekes. It is well built; some of the houses are even very elegant. Pop. 23,100, with a trade in grain, wine, and cattle. The women are also noted for their skill in making sacks and matresses.

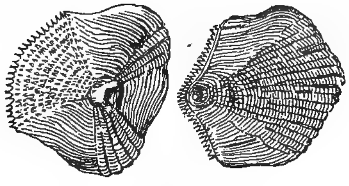
**CSANA'D**, the name of two towns in Hungary, both situated on the Marös, the one with a population of 5000 or 6000, and the other with a population of 8000, who are engaged in agricultural pursuits.

**CSAT**, or **CSATH**, a market-town of Hungary, near the Theiss, and about 15 miles south-east of Miskolcz. Pop. 6000.

**CSOMA DE KÖRÖS**, Alexander, a Hungarian scholar and traveller, whose name in his own language is written Körösei Csoma Sandor, was born about 1790 at Körös in Transylvania, and educated first at the college of Nagy-Enyed, and subsequently at Göttingen, where he devoted himself with great zeal to the study of the Oriental tongues. The dream and inspiration of his boyhood was the hope of one day discovering the original home of his Magyar ancestors; and as he grew up, it became the single thought and passion of his life. In 1820, he set out on his visionary pilgrimage. After a year's interval, his friends got a letter from him, dated Teheran, in which he expressed his conviction that the object of his search would speedily be obtained. Leaving Teheran, he wandered north-east through Little Bokhara, and at length reached Tibet, where he spent about four years (1827—1830) in the Buddhist monastery of Kanam, studying Tibetan. He soon discovered that there was little connection between that language and his native one, but still he hoped to make use of his researches, and set out for Calcutta. Here he learned, to his dismay, that the literature of Tibet was simply a translation from the Sanscrit—a language he might easily have acquired a knowledge of at home. His whole labour seemed to have been in vain. Fortunately for C., the library of the Asiatic Society of Bengal contained upwards of 1000 volumes in Tibetan which no one could catalogue. C. undertook and successfully executed the task. By the great Anglo-Indian scholars, Prinsep, Wilson, and others, he was very generously treated. He next prepared, at the expense of the government, a Tibetan grammar and dictionary (Calcutta, 1834), which was the first really accurate and valuable European work on the subject. It is still a standard treatise, and has been the guide of all good scholars since. C. wrote many articles on Tibetan literature in the *Asiatic Researches*, but still haunted, as of old, by the hope of discovering the early home of the Magyars, he once more set out on an expedition to the western confines of China, but died on the 11th April 1842, at Dorjeeling, a sanitary station for the British troops in Sikkim, 318 miles north of Calcutta.

**CSONGRA'D**, a market-town of Hungary, situated on a neck of land at the confluence of the Theiss and the Körös, 70 miles south-east of Pesth. The inhabitants, 12,600 in number, are chiefly engaged in the rearing of cattle, and the cultivation of the vine.

**CTE'NOID FISHES**, an order of fishes, according to a classification proposed by Agassiz (see FISHES), characterised by *ctenoid* scales, i. e., imbricated scales, generally rounded or ovoid, with teeth or sharp projections on their hinder margin. The name is from the Greek *kteis* (gen. *ktenos*), a comb. The scales of C. F. are horny or bony and unenamelled. There are sometimes numerous rows of teeth or little spines, sometimes only one row, the rows successively wearing off as new ones are formed in the enlargement of the scale. Living C. F. are numerous, fossil ones comparatively few. Perches, flounders, and turbot may be mentioned as examples.



Ctenoid Scales.

**CTESI'BIUS**, a Greek who lived about 250 years B. C., was born at Alexandria, and was famous for his inventions in mechanics. We owe to him and his pupil Hero Alexandrinus, the pump, the bent siphon, and also the discovery of the elastic force of air, and its application as a motive power.

**CTE'SIPHON**, now Al-Madain, was a city of Assyria, on the eastern bank of the Tigris, the common winter residence of the Parthian kings, and finally the capital of the Parthian kingdom. Its ruins still attest its former magnificence.

**CU'BA**, the largest and most westerly of the Antilles (q. v.), and the most important of the transmarine possessions of Spain, lies between the Caribbean Sea on the S., and the Gulf of Mexico, Gulf of Florida, and Bahama Channel on the N., being nearly equidistant from the peninsulas of Yucatan and Florida, and the islands of Hayti and Jamaica. It stretches in N. lat. from 19° 50′ to 23° 9′, and in W. long. from 74° 8′ to 84° 58′, measuring fully 750 miles in extreme length, and little more than 40 in average breadth, with an area of fully 30,000 square miles. C., though chiefly of primary formation, must yet have had its structure modified by volcanic action, for limestone is found high among the mountains, and earthquakes are still frequent. Besides rocky reefs and muddy shallows, which beset about two-thirds of the coast, dependent islets, of which Los Pinos on the south is the most considerable, are very numerous. In many localities, however, the sea is deep to the very shore, offering many excellent havens, and those, too, situated on the busiest thoroughfares of the western hemisphere. Not to mention the ports of lesser note, such as Matanzas, Santiago, &c., the *Havana* (in English, the *Harbour*) may claim, alike in position, and entrance, and commodiousness, to be one of the most eligible in existence. Beginning from the south-east, the Copper Mountains run nearly the length of the island, culminating at an altitude of 6890 feet. With so lofty a watershed on so scanty a width, the rivers are necessarily small, so that very few of them are navigable even at their mouths. But such as they are, they flow all the year round, for every month yields its own supply; and thus they are constantly available for purposes of irrigation. At the Havana, the annual rainfall is said to be 90·66 inches, much more than double of that in the opposite parts of Florida. With regard to atmospheric tendencies in general, C. is superior to most of the West India Islands. Hurricanes are understood to be less frequent and less violent, at least on the land; and the climate, more especially amid the elevated grounds of the interior, is at once pleasanter and more salubrious. With the exception of the central range of mountains, the country is more or less level, its spreading plains and swelling valleys being interspersed with lagoons and marshes. The cultivated portions of the lower tracts—a small part of the whole—produce abundantly maize, rice, yams, bananas, sugar, coffee, tobacco, cotton, cocoa, and indigo; while the uncultivated districts of the same rear countless herds of cattle. For wheat and flour, which have no place in native husbandry, the colony is indebted to the mother-country through a monopoly, which most unfavourably affects both the price and the quality. The elevated regions of the Copper Mountains, besides teeming with the metal from which they derive their name, and here and there producing gold, silver, and iron, are covered with dense forests, in which, besides ship-building timber, palms, the plantain, and the mahogany are conspicuous. In addition to Havana, the capital, C. contains 22 cities and towns, with 204 villages and hamlets. Many of these places communicate with each other by railways, of which the oldest dates from 1838. Of most of these works, Havana is the common terminus, being joined even with Batabano on the south or opposite side of the island without the aid of a tunnel.

In 1850, the population numbered 564,698 whites, 216,176 free people of colour, and 662,587 slaves, together with an unenumerated supplement of eastern coolies. Each of these classes demands separate remark. With the exception of a few foreigners, whose presence is tolerated merely under security for good-behaviour, the whites may be divided into old Spaniards and Spanish creoles. The former engross all the offices and favours in the gift of the government; and the latter conduct most of the agriculture and commerce of the island, being in this connection the main supporters of all 'internal improvements.' Representing, in some measure, all the generations of immigrants from the days of Columbus, the Spanish creoles, vastly outnumbering the old Spaniards, form a great and growing majority of the inhabitants of European blood. In 1855, only 9000 white children, being clearly under a tenth of the full tale, were attending school. The condition of the negro, not merely in C., but through Spanish and Portuguese America generally, does not render its possessor an outcast. Men of colour are permitted to serve in the colonial militia, and the foremost literary character in the island is, or at least in 1855 was, a mulatto poet. Even the slaves themselves are not destitute of legal rights. They may, if they can, buy their liberty, being entitled to secure even partial exemptions from their toil in return for partial payments of their value; and, meanwhile, their domestic relations are recognised, and their corporal punishments restricted to five-and-twenty lashes. That such legal rights, however, must often be a dead-letter, one may safely infer from the fundamental fact, that many, perhaps most, of the slaves are wrongfully held in servitude. Under a treaty with England, to enforce which a court of mixed commission sits at the Havana, Spain has long been bound to abolish the slave-trade; but neither the court nor the treaty has availed much, on account of the interested connivance of the local authorities. Nor are the national rulers themselves above the suspicion of complicity in this organised piracy. As regards the eastern coolies, the immigration from Asia is fully as hideous as that from Africa. It is well known to be, too often, equally involuntary in its origin; it inevitably encounters, for a longer period, the horrors of the middle passage; and lastly, it is apt to result in the collusive sale of such of its apprentices as may not have been worked to death during their term of indenture. The aboriginal population of C. has been exterminated by the sword, the scourge, and the blood-hound.

In 1492, this Queen of the Antilles was discovered by Columbus during his first voyage. He called the island *Juana*, and Velasquez afterwards named it *Fernandina*, but neither supplanted the native name *Cuba*. In 1511, the island began to be permanently colonised, becoming, within ten years, the base of all the various operations against Mexico. While, in the first quarter of the present century, every continental portion of Spanish America established its independence, C. remaining, like Porto Rico, faithful to the mother-country, largely profited by the intestine broils of the revolted provinces, for, when the old Spaniards were expelled in mass from the mainland, many of them naturally took refuge in the still loyal islands, enriching them with their capital, and energy, and skill. C. has long been coveted by other nations. In 1762, the Havana was captured by a British armament, but was restored in the following year. During the present age, the island has been an object of cupidity to the United States—a cupidity checked more powerfully by jealousy on the part of France and England than by Spain's own resources; and, in fact, it has been twice attacked—in 1850 and 1851—by individual Americans without success. They were commanded by a Spaniard of the name of Lopez, who, being taken prisoner, was executed as a traitor.

The government is understood to be thoroughly corrupt in all its departments. It seems to be as costly, too, as it is worthless. The taxation, according to an apparently authentic statement, is estimated to be equivalent to 2½ per cent. on a collective valuation of 800,000,000 dollars, the actual burden reaching £4,000,000 sterling. The army ranges between 13,000 and 28,000 men; while the navy consists of 4 frigates, 15 steam-ships, and 32 small-craft. The imports, without reckoning the illicit cargoes of 'live-stock' from Africa, are salted fish, bread-stuffs, and manufactured goods; and the exports consist mainly of sugar, coffee, tobacco, wax, cotton, cocoa, indigo, molasses, and rum. Excepting the importation of slaves, which is almost exclusively carried on by some of the 'free' states of the American Union, this external trade, in both its branches, is carried on with Spain, the United States, Germany, England, France, &c.—the first two countries being nearly on a par as to value, and either of them being vastly ahead of any of the others. Ever since the epoch of the general peace in 1815, the material prosperity of C. has rapidly advanced. Between the year last mentioned and 1827, the customs of the Havana swelled from 1,725,963 dollars to 4,383,262 dollars. Between 1827, again, and 1850, the exports had more than doubled in amount, having grown from 13,111,416 dollars, to 26,684,602 dollars. In 1855 they amounted to £7,395,600. Such progress, so exceptional in a Spanish community of recent times, has been, in a great measure, owing to extrinsic events. Among these, the most prominent have been the independence of Hayti, the emancipation of the blacks in the British West Indies, and the abolition in England of those differential duties which had operated as a premium on colonial production.

**CUBA'GUA**, an island in the Caribbean Sea, off the north-east coast of Venezuela in South America, is situated in the department of Maturin, between Margarita and the mainland, about 30 miles north of the town of Cumana.

**CUBE**, a solid with six square faces, each of which is parallel to the one opposite to it. It is a form of frequent occurrence in nature, especially among crystals. See CRYSTALLOGRAPHY. In arithmetic, the C. of a number is the product of its multiplication three times by itself. This use of the term arises from the circumstance that the solid contents of a C. may be expressed by the third power of the number which expresses the length of one of its edges. Thus, if the edge of a C. be a line of 4 inches, its solid contents are equal to 64 cubic inches. Conversely, the C. root of a number is that number which, multiplied three times by itself, produces the first number. See DOUBLING THE CUBE.

**CU'BEBS**, or **CUBEB PEPPER**, the dried berries of *Cubeba officinalis* and other species of *Cubeba*, a genus of climbing shrubs of the natural order *Piperaceæ*, very closely allied to the true peppers, but distinguished at once by the contraction and elongation of the berries at the base, so that they appear to be stalked, upon which account C. are sometimes called *Piper caudatum*, or tailed pepper. *Cubeba officinalis* is a native of Penang, Java, New Guinea, &c., and is said to be extensively cultivated in some parts of Java. Its spikes are solitary, opposite to the leaves, and usually produce about fifty berries, which are globular, and when dried, have much resemblance to black pepper, except in their lighter colour, and the stalk with which they are furnished. *Cubeba canina*, a native of the Sunda and Molucca Islands, is supposed also to yield part of the C. of commerce, and the berries of *C. Wallichii* possess similar properties. C. are less pungent, and more pleasantly aromatic than black pepper; they are used in the East as a condiment, but in Europe chiefly for medicinal purposes; they act as a stimulant, and are sometimes found useful in cases of indigestion, also in chronic catarrhs, and in many affections of the mucous membrane, particularly those of the urino-genital system. C. contain a principle called *Cubebine*, analogous to that contained in pepper (*piperine*). C. appear to have been known in Europe from ancient times. In 1305, Edward I. granted to the corporation of London the power of levying a toll of one farthing on every pound of C. passing over London Bridge.

**CUBIC EQUATIONS.** A cubic equation containing but one unknown quantity, is one in which the highest exponent of the quantity in any term is 3. Every such equation can be reduced to the general form $x^3 + px + q = o$, in which the coefficient of $x^3$ is 1, and that of $x^2$ is zero. Every cubic equation of this form has three roots, all of which may be real, or one only may be real, and the other two imaginary. The roots will all be real, when $p$ is essentially negative, and $\frac{p^3}{27} > \frac{q^2}{4}$ numerically. One root only will be real when $p$ is essentially positive, or when it is negative, and $\frac{p^3}{27} < \frac{q^2}{4}$ numerically. If $p$ is essentially negative, and $\frac{p^3}{27} = \frac{q^2}{4}$, two of the roots are equal. When one of the roots only is real, the equation may be solved by the following formula, known as Cardan's formula:

$$x = \sqrt[3]{-\frac{q}{2} + \sqrt{\left(\frac{q^2}{4} + \frac{p^3}{27}\right)}} + \sqrt{-\frac{q}{2} - \sqrt{\left(\frac{q^2}{4} + \frac{p^3}{27}\right)}}.$$

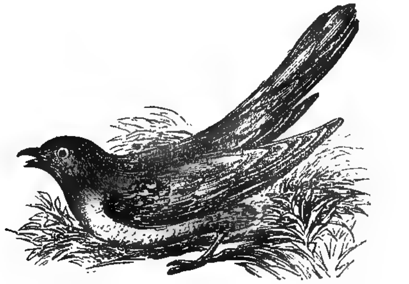
When the roots are all real, this formula fails to give their values. Methods of solving C. E. are to be found in most books on trigonometry and algebra. They are all troublesome. The reader will find the theory of their solution admirably discussed in Young's *Theory of Equations*. See also EQUATIONS and EQUAL ROOTS.

**CU'BICAL NI'TRE** is a commercial name applied to the nitrate of soda ($NaONO_5$). See SODA.

**CU'BIT** (Lat. *cubitus*), a measure employed by the ancients, equal to the length of the arm from the elbow to the tip of the middle-finger. The C. of the Romans was about $17\frac{2}{5}$ inches, and that of the Hebrews 22 inches, but its length is now generally stated at 18 English inches.

**CUCKING-STOOL.** See DUCKING-STOOL.

**CU'CKOO** (*Cuculus*), a genus of birds of the order of Climbers (q. v.); the type of a family, *Cuculidæ*, which contains a large number of species, mostly confined to the warmer regions of the globe, although some of them are summer visitants of cold climates. The beak is compressed and slightly arched, and the tail long and rounded, the wings rather long, the tarsi short, two toes directed forwards, and two backwards, the outer hind-toe capable of being brought half round to the front. The feet are thus adapted for grasping and moving about upon branches, rather than for climbing, and the long tail is much used by many of the species for balancing the body, as they hop from branch to branch in the thick tropical woods which they frequent. The name C. is derived from the note of the male of the Common C. (*Cuculus canorus*), which, although monotonous, is always heard with pleasure, being associated with all that is delightful in returning spring. A similar name is given to the bird in many languages. The C. is a very widely diffused bird; it is found in India and in Africa, and migrates northwards in summer, even to Lapland and Kamtchatka. It appears in Britain in April, and all except the young birds are believed to migrate southwards again before the middle of August. It frequents both cultivated districts and moors. There is no pairing or continued attachment of the male and female, and the female generally, if not always, lays her eggs in the nest of some other smaller bird, usually one egg in a nest, leaving the egg to be hatched and the young one to be fed by the proper owners of the nest. The egg of the C. is very small for so large a bird, about equal in size to that of the skylark; but the young one soon acquires size and strength enough to eject from the nest any eggs which may remain in it, or unfortunate young birds, the true offspring of its foster-parents, and it seems restless and uneasy till this is accomplished. It works itself under them, and then jerks them out by a motion of its rump. Its back at this early age exhibits a peculiar depression between the shoulders, so that an egg or a young bird can easily be got to lie upon it; but this depression soon disappears, and along with it the singular instinct with which it is supposed to be connected. The hedge-sparrow, the yellow-hammer, the pied wagtail, and the meadow pipit, are among the birds most frequently selected by the C. as its substitutes in incubation and the care of its young.—Among the *Cuculidæ* of North America, one of the most interesting is the Yellow-billed American C., sometimes called from its note the *Cow-cow*, or *Cow-bird* (*Coccyzus Americanus*), which, in its summer migrations, visits all parts of the country from Louisiana to Labrador. It is among the rarest of British birds, but several instances are recorded of its occurrence in the British islands. It does not lay its eggs in the nests of other birds, but builds and hatches for itself—exhibiting, however, a remarkable peculiarity in laying its eggs at such long intervals, that a very evident difference of age appears among the young in the same nest.

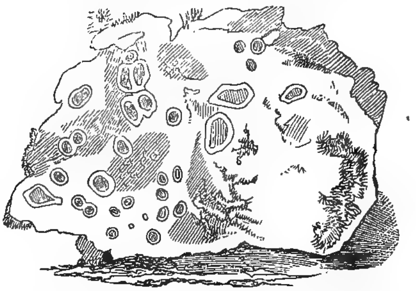


Common Cuckoo (*Cuculus canorus*).

**CU'CUMBER** (*Cucumis*), a genus of plants of the natural order *Cucurbitaceæ*. The COMMON C. (*C. sativus*), distinguished by heart-shaped, acuminately pentangular leaves, which are rough with hairs approaching to bristles, and oblong fruit, is a native of the middle and south of Asia, and has been cultivated from the earliest times. Its fruit forms an important article of food in its native regions, the south of Europe, &c., and an esteemed delicacy in colder countries, where it is produced by the aid of artificial heat. Many varieties are in cultivation, with fruit from four inches to two feet long, rough, smooth, &c. Young cucumbers are much used for pickling, and are called *gherkins*. The C. is cultivated in fields even in the south of England, for the supply of the London market; but in the northern parts of Britain, the aid of a hot-bed is required even to produce fruit fit for pickling. The C. requires a sunny situation, and a free rich soil.—To this genus belong other species valued for their edible fruit. *C. Anguria* is a West Indian species, with fruit about as large as a pullet's egg, much esteemed as an ingredient in soups. The SNAKE C. (*C. flexuosus*) grows to a great length, and is similar in quality to the common cucumber. *C. serotinus* is cultivated in Turkey, *C. macrocarpus* in Brazil; the CONOMON (*C. conomon*) is much cultivated in Japan. The Melon (*C. melo*), Water Melon (*C. citrullus*), Chate (*C. chate*), and Kaukoor (*C. utilissimus*), are noticed in the article MELON; the species yielding colocynth, in the article COLOCYNTH.—The DUDAIM (*C. dudaim*) is very generally cultivated in gardens in the East for the fragrance of its fruit, which, however, is almost tasteless. It is supposed that this plant is sometimes meant in the Old Testament, where the English version has *mandrake*.—The SPIRTING C., SQUIRTING C., or WILD C., which yields the drug called Elaterium (q. v.), belongs to an allied genus.

**CUCURBITA'CEÆ**, a natural order of exogenous plants, consisting chiefly of herbaceous plants, natives of the warmer regions of the globe, having succulent stems which climb by means of lateral tendrils. There are some shrubby species. The fruit (*pepo*) is peculiar; it is more or less succulent, has a thick fleshy rind, and the seed bearing parietal placentæ either surrounding a central cavity, or sending prolongations inwards. The seeds are flat and ovate, embedded in a sort of pulp, which is either dry or juicy.—This order contains about 300 species, very many of which yield fruits much used for food in warm climates, and some of them are cultivated in colder regions as articles of luxury. The fruit of some attains a very large size. To this order belong the Cucumber, Melon, Gourd (of many kinds), Pumpkin, Squash, Vegetable Marrow, Bottle Gourd, &c. The young shoots and leaves of many species are also used as potherbs; and the roots of some abound in a bland fecula, and are edible, as those of *Momordica dioica* and *Bryonia umbellata*, East Indian plants. Yet acridity is a prevailing characteristic, of which the Spirting Cucumber (see ELATERIUM) of the south of Europe, and the Common BRYONY (q. v.) are examples. These are not without their use in medicine, but still more important is the COLOCYNTH (q. v.).—Among the more interesting species of this order is *Hodgsonia heteroclita*, a gigantic species, which is found in the Himalaya Mountains, ascending to an elevation of 5000 feet. The seeds of some C. are used as almonds, and yield oil by expression, as those of *Telfairia pedata*, an African plant. *Bryonia dioica* is the only British species, and does not extend to Scotland.

**CU'DBEAR**, a dyestuff similar to Archil (q. v.) and Litmus (q. v.), and obtained in the same manner from lichens by the action of ammoniacal liquids. It is chiefly employed as a purple-dye for woollen yarn, but the colour is rather fugitive. The name C., or C. LICHEN, is often appropriated to one particular species of lichen, *Lecanora tartarea*, which is abundant on rocks in the Highlands of Scotland and in the Alpine and northern districts of Europe, and from which the dyestuff C. is usually obtained by maceration for ten or twelve days in urine with water and chalk. The name is a corruption of *Cuthbert*, and is derived from that of Dr Cuthbert Gordon, under whose management the manufacture of this dyestuff was begun in Leith about the year 1777, by Mr Macintosh of Glasgow. The species of the genus *Lecanora* are crustaceous lichens, with a flat uniform *thallus*, and unstalked *shields*. *L. tartarea* forms a thick, granulated, and tartareous grayish-white crust, with scattered yellowish-brown shields. It is sometimes called *White Swedish Moss*, being largely imported from Sweden.



Cudbear (*Lecanora tartarea*).

**CUDDALO'RE**, the chief town in the southern division of Arcot (q. v.), is one of the few seaports on the Coromandel, or east coast of Hindustan. It is situated on the estuary of the Southern Pennaur, a considerable tributary of the Bay of Bengal, being in lat. 11° 43′ N., and long. 79° 50′ E. It is 15 miles to the south of Pondicherry, and 100 to the south of Madras. Though the river itself is beset by a bar, which admits only vessels of moderate size, yet there is good anchorage off-shore at the distance of a mile and a half. The site is not more than 5 feet above high-water mark; but notwithstanding this apparently insalubrious position, the climate is said to be peculiarly healthy. C. was at one time a place of great strength; and in that respect it was frequently an object of contention in the wars which, during the latter half of the 18th c., so long desolated this neighbourhood. In 1758, it was taken by the French from the English, who had held it for 77 years; and, after various intermediate vicissitudes, it was finally ceded to its original possessors in 1783.

**CU'DDAPAH**, a native town with a military cantonment in the presidency of Madras, from which it lies about 140 miles to the north-west. It stands, at the height of 507 feet above the sea, near the right or south bank of the Northern Pennaur, which flows into the Bay of Bengal. Lat. 14° 32′ N., and long. 78° 52′ E. The native town itself claims notice merely as the capital of the district of its own name; and the military cantonment, pleasantly overhanging the Bogawanka, an auxiliary of the Pennaur, contains barracks for Europeans, and spacious lines for sepoys.

**CUDDAPAH**, the district mentioned in the preceding article, extends in lat. from 13° 12′ to 16° 19′ N. and in long. from 77° 52′ to 79° 48′ E., containing 12,970 square miles, and 1,451,921 inhabitants. Sloping towards the Bay of Bengal, the country ranges, in its general elevation above the sea, between 1182 and 450 feet. C. is traversed in its length from north to south by numerous parallel ridges, which constitute a part of the Eastern Ghauts—some of the peaks rising 3500 feet above the sea level. The maximum, mean, and minimum temperatures are said to be respectively 98°, 81°, and 65° F. In the hot season, the climate is understood to be peculiarly prejudicial to European constitutions. The most striking feature in the physical character of the district is the remains of diamond mines, now abandoned, and probably exhausted, situated about seven miles from the capital. C. was ceded to Britain in 1800; and in 1846 it was the scene of serious disturbances, occasioned by an unwise interference on the part of government with the prescriptive titles to landed property.

**CU'DDY** was a name first applied in East India trading ships to a cabin under the poop, where the men messed and slept. The same name was afterwards given to the only cabin in very small vessels, and sometimes to the cooking-room.

**CU'DWEED**, the popular name of many species of plants of the genera *Gnaphalium*, *Filago*, and *Antennaria*, belonging to the natural order *Compositæ*, sub-order *Corymbiferæ*, the stems and leaves of which are more or less covered with a whitish cottony down; and the heads of flowers consist, in great part, of dry involucral scales, and may be kept for a long time without undergoing much apparent change, so that they may be reckoned among *Everlasting Flowers* (q. v.). The cudweeds are small plants of very unpretending appearance, some of them common in Britain. *Antennaria dioica* is very frequent in dry mountain pastures. It is sometimes called Cat's-foot. Its heads of flowers, from the appearance of which it derives this name, were formerly officinal, and were employed as an astringent in pectoral diseases.

**CU'DWORTH, RALPH, D.D.**, an illustrious English divine, was born in 1617 at Aller, in Somersetshire, and admitted pensioner of Emmanuel College, Cambridge, in 1630, where he took his degree of M.A., and became an eminent tutor. About 1641 he was presented to the rectory of North Cadbury, in Somersetshire; and in 1644, upon taking his degree of B.D., maintained two theses, in which can be discerned the germs of his *Intellectual System*. In the same year he was appointed master of Clare Hall, Cambridge, and in 1645, regius professor of Hebrew; after which he began to apply himself assiduously to the study of Jewish antiquities. In 1651, he took his degree of D.D.; in 1654, he was chosen master of Christ's College; in 1662, appointed to the vicarage of Ashwell; and in 1678, installed prebendary of Gloucester. He died at Christ's College, July 26, 1688.

C.'s *magnum opus*, entitled *The True Intellectual System of the Universe*, was published in 1678. It is a work of great learning, acuteness, and loftiness of thought; but some, at the time, fancied that C. exhibited too much impartiality in stating the atheistic arguments. Dryden said 'that he raised such strong objections against the being of a God and Providence, that many thought he had not answered them.' Lord Shaftesbury and Bayle were of this opinion also. The accusation of impartiality —a rare offence in those contentious days—is not likely to lessen our admiration of Cudworth. The philosophy to which he was attached was that of Plato, and, in consequence, he estimated highly the writings of the Alexandrian school, to which his own bear some resemblance. The obloquy to which his adventurous studies exposed him, does not seem to have greatly affected him. Besides *The Intellectual System*, C. left in MS. *A Treatise concerning Eternal and Immutable Morality*, which was published by Dr Chandler, Bishop of Durham, in 1731; and forms, or was intended to form, the second part of *The Intellectual System;* also a discourse *On Liberty and Necessity*, *On Moral Good and Evil*, a discourse *On the Creation of the World and the Immortality of the Soul*, &c. These MSS. are now in the British Museum.

**CUE'NCA**, a city of Spain, at the confluence of the Jucar and Huecar, about midway between Valencia and Madrid. It is romantically situated on a rocky eminence, 3400 feet above the level of the sea, and is surrounded by hills. It appears to have derived its name (Lat. *concha*, a shell) from its position and appearance. Ford says it is 'indeed a hill-girt *shell*.' The town is of Moorish origin. The streets are narrow and crooked. The chief buildings are the cathedral, the bishop's palace, and a fine bridge over the Jucar (erected in 1523), connecting the city with the convent of San Pablo. C. was once celebrated for arts, literature, and industry, but its glory has now quite departed. It suffered much during the Peninsular campaign. Pop. 6000.—C. gives name to a mountainous well-watered province, yielding excellent timber, honey, wine, and grain, with good pasture, and various minerals, including iron, coal, copper, and silver. Area about 12,000 miles. Pop. (1857) 230,000.

**CUENCA**, a city of Ecuador, in South America, stands on a wide plain or table-land, 8640 feet above the level of the sea. It is 85 miles south-south-west of Quito, the capital of the republic; in lat. 1¼° S., its proximity to the equator, however, being largely neutralised, with regard to climate, by its altitude. Pop. estimated at 20,000. It possesses a cathedral and a university.

**CUE'VA DE VE'RA**, a town of Spain, in the province of Granada, 42 miles north-east of Almeria. It is situated on a plain on the right bank of the Almanzor, near its entrance into the Mediterranean. It is generally well built, and its streets regular. The principal edifices are an old Moorish castle, and the parish church in the Doric style. C. has manufactures of hardware, earthenware, and of wine and oil; and a large number of persons are employed in mines in the vicinity. Pop. 10,000.

**CUICHUNCHU'LLI** (*Ionidium parviflorum*), a Peruvian plant of the natural order *Violaceæ*, half-shrubby, with minute leaves, possessing very active emetic and purgative properties, and said to be a certain remedy for *Elephantiasis tuberculata*, a reputation which, if even partially well founded, ought to recommend it to the particular attention of the benevolent and humane. Other species of *Ionidium* share the same name, properties, and reputation. One of them was formerly supposed to yield ipecacuanha, and its root is still known as White Ipecacuanha. See IPECACUANHA.

**CUIRA'SS**, as its name (Fr. *cuir*, leather) implies, was originally a jerkin, or garment of leather for soldiers, so thick and strong as to be pistol-proof, and even musket-proof. The name was afterwards applied to a portion of armour made of metal, consisting of a back-plate and breast-plate hooked or buckled together; with a piece jointed to the back called a *culet* or *garde de reines*.

**CUIRASSIE'RS**, in the time of Queen Mary, were heavy horsemen wearing body-armour over buff-coats. They carried swords and pistols, and the reins were strengthened with iron chains. In modern armies, the name is often given to the heaviest cavalry. Napoleon's twelve regiments of C. attracted much attention during his wars. The first rank of Russian C. are armed with lances. The only C. in the British army (wearing the cuirass) are the Life Guards (red) and Horse Guards (blue); and in these the cuirass is now regarded rather as a matter of show than of use.

**CUISSARTS**, among ancient armour, were worn by troopers. They consisted of small strips of iron-plate laid horizontally over each other round the thigh (Fr. *cuisse*), and riveted together.

**CUJA'CIUS**, properly, JACQUES DE CUJAS, or CUJEUS, one of the most distinguished jurists of the 16th c., born in 1522, was the son of a tanner of Toulouse. After studying law, he was appointed teacher of the same at Cahors (1554), and in the following year, by the recommendation of the Chancellor L'Hopital, gained the chair of law in the university of Bourges. In 1557, he became a professor at Valence. After several changes, he returned to Bourges in 1577, where he resided till his death, October 4, 1590.

His great reputation as a jurist was founded on his study of original MSS. of the Roman laws, and on his classical treatment of these authorities. He had in his library 500 MSS. on Roman law, and by his emendations contributed greatly to remove the obscurities of jurisprudence. A complete collection of his works was edited by Fabrot (10 vols., Par. 1658), and has since been republished frequently. Uhl has edited separately C.'s *Animadversiones et Observationes.* C.'s daughter made herself notorious by her immoralities. See Spangenberg's *C. und seine Zeitgenossen* (Leip. 1822).

**CU'LDEES, or KELDEES** (Celt. *Ceile De;* Lat. *Colidei*, *Culdei*, *Calledei*, *Keldei*, *Keledei*), the name given in the British islands to an ancient order of ecclesiastics. The word seems to be of Celtic origin, and in the Irish language signifies an 'attendant of God.' Giraldus Cambrensis, writing towards the end of the 12th c., when the order still flourished, interprets the name in one place by the Latin word *cœlicola*, i. e., 'worshipper of heaven;' and in another by *cœlebs*, i. e., 'single,' or 'unmarried.' Boece and Buchanan, in the 16th c., translate it *cultores Dei*, i. e., 'worshippers of God.'

There is some uncertainty as to the first appearance of the order. There is no trace of it in the works of Adamnan, of Bede, of Alcuin, or of any other ecclesiastical historian of the 8th or 9th century. An abbot and bishop of the north of Ireland, who compiled a metrical calendar of Irish saints about the year 800, was known in his own time as 'Ængus the Ceile-De.' But it has been questioned whether the title was not used rather to denote his great personal piety, than to describe his ecclesiastical character. The Four Masters, again, in their *Annals of Ireland*, compiled about the year 1636, record certain great wonders wrought by a Ceile-De in the year 806. But no such event is recorded in the ancient chronicles from which the Four Masters compiled their work, and Irish antiquaries think that the passage must therefore be rejected as apocryphal. But in Irish annals of undoubted authority, it is chronicled that, in the year 919, 'a Ceile-De came across the sea westward to establish laws in Ireland;' in other words, as Irish archæologists conjecture, to bring the Irish into conformity with the rule for canons which had been enacted in 816, at the council of Aix-la-Chapelle. The Annals of Ulster record that, in 920, Armagh was plundered by Godfrey, son of Ivor, the Dane, but that he spared the oratories with the C. and the sick. The C. of Armagh, who thus appear in the beginning of the 10th c., survived till the beginning of the 17th century. Archbishop Usher, who died in 1655, writes that they continued until within his own memory. They were secular priests or canons, about twelve in number, living in community, under the rule of a prior, who—after the beginning of the 13th c., when the metropolitan cathedral of St Patrick was remodelled after the English fashion—officiated as precentor, his C. being the clerks or choir. The antiphonary or service-book, with the musical notation, from which they sang, is still preserved in the library of Trinity College, Dublin; and its calendar records the deaths of several of their number, one of them so lately as the year 1574. The prior seems generally to have been a pluralist, it having been formally ruled in 1448, after an appeal to Rome, 'that the priory of the college of secular priests, commonly called Culdees, being a simple office, and without cure of souls, is not incompatible with a benefice.' The C. of Armagh, dissolved at the Reformation in 1541, were resuscitated for a brief space in 1627. Their old possessions—among which were seven town-lands containing 1423 acres, seven rectories, and four vicarages—were, in 1634, bestowed upon the vicars choral of the cathedral, who still enjoy them.

There were at least seven other houses of C. in Ireland, viz., at Clonmacnois, Clondalkin, Devenish, Clones, Popull, Monanincha, and Sligo.

If tradition could be trusted, the first appearance of C. in Scotland should be placed about the middle of the 9th century. A leaf of the Register of St Andrews, written about 1130, relates that Brude, the son of Dergard, the last king of the Picts (who ceased to reign about 843), gave the island, since called St Serf's Inch, in Lochleven, to God, St Servan, and the Culdee hermits serving God there. They were governed by an abbot; and about the year 1093, during the rule of Abbot Ronan, they gave up their island to the Bishop of St Andrews, on condition that he should find them in food and raiment. They had grants of lands or immunities from all the kings of the Scots who reigned between 1039 and 1153, the roll of these royal benefactors being headed by the renowned Macbeth (1039—1056) and his wife Gruoch, the daughter of Bodhe. They had a grant of a church from each of the three bishops who ruled the see of St Andrews between 1040 and 1093; and about 1120, they had a grant of lands from one of the sons of King Malcolm Canmore and St Margaret—Ethelred, Earl of Fife, and hereditary lay-abbot of the Culdee monastery of Dunkeld. A few years afterwards, the Bishop of St Andrews gives their island, and all their possessions, including their church vestments and their books, to the newly founded Canons Regular of St Andrews, in order that a priory of that rule might supplant the old abbey of C. in St Serf's Inch. About 1140, the bishop's grant was enforced by a charter from King David, in which it was ordered that such of the C. as chose to live canonically and peacefully under the new canons should remain in the island. 'If any one of them refuse so to do,' says the king, 'my will is, and I command, that he be expelled from the island.' We hear no more of the Culdee hermits of Lochleven. The Canons Regular who came in their place continued till the Reformation, and we are indebted to one of their priors, Andrew Wyntoun, who died about 1429, for a valuable metrical Chronicle of Scotland. A catalogue of the books of the Culdee abbey, when it was bestowed upon the Canons Regular of St Andrews, about 1140, has been preserved. The number of volumes was not quite twenty. They were—a Pastoral, a Gradual, a Missal, some of the works of Origen, the Sentences of St Bernard (who was still living), a Treatise on the Sacraments, in three parts, a part of the Bible, a Lectionary, the Acts of the Apostles, the Gospels, the works of Prosper, the books of Proverbs, Ecclesiastes, and Canticles, a Gloss on the Canticles, a work called *Interpretationes Dictionum*, a Collection of Sentences, a Commentary on Genesis, and a Treatise on the Exceptions from Ecclesiastical Rules.

The C. of St Andrews were of more importance, and not perhaps of less antiquity, than those of Lochleven. The death of an abbot of St Andrews is chronicled by the Irish annals in 747. It is not said that he was a Culdee; but in 944, when Constantine, the king of Scots, exchanged his crown for a monk's cowl, it is recorded that he became 'abbot of the Culdees of St Andrews.' No more is heard of them till about the middle of the 12th century. A priory of Canons Regular had now been planted beside them, and from its records we learn that in the church of St Andrew, such as it then was, there were thirteen C., holding their office by hereditary tenure, and 'living rather according to their own pleasure and the traditions of men, than after the rules of the holy fathers;' that some few things of little importance they possessed in common; that the rest, including what was of most value, they held as their private property, each enjoying what he got from relatives and kinsmen, or from the benevolence granted on the tenure of pure friendship, or otherwise; that after they became C., they were forbidden to have their wives in their houses, or any other women of whom evil suspicion could arise; that the altar of St Andrew was left without a minister, nor was mass celebrated there except on the rare occasion of a visit from the king or the bishop, for the C. said their own office after their own way in a corner of the church. The attempt to supplant the C. by Canons Regular, which had succeeded at Lochleven, was repeated at St Andrews, but failed. The C. kept their own church—St Mary's, or the Kirk of the Heugh—and had a voice along with the Canons Regular in the election of the bishop. Their abbot disappears about the middle of the 11th c.; and soon afterwards their 'prior' exchanges that title for the name of 'provost.' Their distinctive character was gradually passing away; before the end of the 14th c. they lose their share in the election of the bishop; their name of Culdee is heard no more; their church, about the same time, takes the name of the King's Chapel-royal; and henceforth there remains nothing to distinguish them from the secular priests of other collegiate churches.

The C. of the church of St Mary at Monymusk, in Aberdeenshire, appear to have been founded by the Bishop of St Andrews towards the end of the 11th century. In the beginning of the 13th c. they are found making claim to be regarded as Canons Regular. The claim was resisted by the Bishop of St Andrews, and in 1211, after an appeal to Rome, the dispute was settled by a compromise, which provided that there should be thirteen C. at Monymusk, of whom one—to be chosen by the bishop from a list of three presented by the other C.—should be the master or prior; that they should have a refectory, a common dormitory, and an oratory, but no cemetery; that they should not adopt the monastic or canonical life or rule without leave of the bishop; and that when he came to Monymusk, he should be received by the C. in solemn procession. Before this agreement is 50 years old, the name of C. disappears from Monymusk, and their house is recognised as a priory of Canons Regular.

C. are found at Abernethy, in Strathearn, about 1120. In the end of that century, their possessions appear to have been divided between their hereditary lay-abbot (the founder of the noble family of Abernethy) and the prior and C. by whom the burden of the ecclesiastical offices was borne. In 1273, they were transformed into Canons Regular. The same partition of the Culdee revenues which appears at Abernethy, is found also at Brechin. A layman, who is abbot only in name, inherits a large share of the Culdee patrimony, and transmits it to his descendants, who soon lose even the name of abbot. The prior and his C., meanwhile, are absorbed into the chapter of the new bishopric, founded at Brechin by King David I., about 1145; in less than a hundred years, the name of C. disappears, and the chapter is one wholly of secular canons. The same silent change of C. into secular canons, which took place at Brechin during the 13th c., took place also at Dunblane, at Dunkeld, at Lismore, at Rossmarky, and at Dornoch. C. are found in the bishop's chapter at each of these places in the 12th c.; they disappear before the end of the 13th c., leaving the chapter one of secular canons. At Dunkeld, as at Brechin and at Abernethy, great part of the Culdee revenues was held by a lay-abbot, whose office was of such mark as to be hereditary in the royal family. The father of 'the gracious Duncan,' and the son of St Margaret, were Culdee abbots. If a tradition of the 16th c. can be received as authority for what passed in the 12th c., the C. of Dunkeld were married, like the priests of the Greek Church, but lived apart from their wives during their period of service at the altar.

C. are found holding land at Monifeith, near Dundee, about 1200; and there was a lay-abbot of Monifeith; but there is nothing to shew whether he was or was not a Culdee. The C. of Muthill, in Strathearn, appear with their prior in charters of the beginning of the 13th century. Nothing more is known of them. Jocelin of Furnes, in his Life of St Kentigern, or Mungo, written about the year 1180, relates that the disciples of that saint at Glasgow, in the 6th c., had all things in common, but lived each in his own hut, whence they were called 'solitary clerks,' and more commonly 'Culdees.' C. appear as one of the ecclesiastical fraternities of Iona in the year 1164; and the faint vestiges of a circular building (about 15 feet in diameter) called 'Cothan Cuildich,' or the Culdee's cell, are still shewn in the island.

Only one or two traces of C. have been observed in England. The canons of St Peter's, at York, were called C. in the reign of Æthelstan (924—931); and a charter of Æthelred, in the year 1005, speaks of the canons of the English cathedrals generally as *cultores clerici.* The term is of doubtful import, and the charter itself is not beyond suspicion.

Of the C. in Wales, we have only one notice. Giraldus Cambrensis, writing about 1190, describes the island of Bardsey, on the coast of Caernarvon, as inhabited by 'most devout monks, called celibates or Culdees.'

Such is a concise recapitulation of all that is certainly known of the Culdees. Before their history was ascertained, opinions were held regarding them which now find few if any supporters among archæologists. It was believed that they were our first teachers of Christianity; that they came from the East before corruption had yet overspread the church; that they took the Scripture for their sole rule of faith; that they lived under a form of church-government approaching to Presbyterian parity; that they rejected prelacy, transubstantiation, the invocation of saints, the veneration of relics, image-worship, and the celibacy of the clergy; and that they kept their simple worship and pure doctrines undefiled to the last, and were suppressed only by force and fraud, when the Roman Catholic Church triumphed over their older and better creed. For all this, it is now clearly seen that there is no foundation. There is no reason to suppose that the C. differed in any material point of faith, discipline, or ritual from the other clergy of the British islands and Western Christendom. Their name was their only peculiarity.

The best account of the Irish C. is given in a dissertation by the Rev. Dr Reeves, in the *Proceedings of the Royal Irish Academy* for 1860. The best account of the Scottish C. is given in Mr Grub's *Ecclesiastical History of Scotland*, vol. i. pp. 226—243 (Aberd. 1861). The opinions formerly held regarding the Scottish C. will be found in Selden's preface to the *Decem Historiæ Anglicanæ Scriptores*, reprinted in his *Opera*, vol. ii. pp. 1129—1146; Sir J. Dalrymple's *Collections concerning the Scottish*

*History* (Edin. 1705); and the late Rev. Dr Jamieson's *Historical Account of the Ancient Culdees* (Edin. 1811). The opinions of these writers are controverted in Bishop Lloyd's *Historical Account of Church Government*, chap. vii.; Goodall's *Preliminary Dissertation*, and Bishop Russell's *Supplement*, prefixed to Keith's *Catalogue of Scottish Bishops* (Edin. 1824); Pinkerton's *Inquiry into the Early History of Scotland*, vol. ii. pp. 270—273 (edit. 1814); and Chalmers's *Caledonia*, vol. i. pp. 434—439 (Lond. 1807). On the subject of the C. generally, reference may be made to Lanigan's *Ecclesiastical History of Ireland*, vol. iv. pp. 290—317; and to the dissertation by J. van Hecke in the *Acta Sanctorum Octobris*, vol. viii. (Brussels, 1853).

**CU'LENBORG, CU'LEMBORG,** or **KUI'LENBURG,** a commune and town of the Netherlands, situated on the left bank of the river Leck, 10 miles north-west-by-west of Tiel. The city is surrounded by walls and fosses, and contains a Reformed, a Lutheran, a Roman Catholic, and a Jansenist church, a small synagogue, and a fine orphan-house. It has a daily steam-boat intercourse with Rotterdam. C. has several factories of various kinds. In olden times, the 'Dominion of Culenborg' formed a county by itself, and its independence, both of the Roman empire and the States of Holland, secured it the singular privilege of offering an asylum to fugitives from Holland for debt. Pop. 5404.

**CULIACA'N,** a town of the Mexican confederation, stands on a river of its own name, which, flowing towards the south-west, enters the Gulf of California near its mouth. It occupies a fertile tract in the department of Sinaloa, being about 90 miles to the south-east of the city so called. It is estimated to contain 7000 inhabitants.

**CULILAWAN BARK,** also called Clove Bark, a valuable aromatic bark, the product of the *Cinnamomum Culilawan*, a tree of the same genus with the Cinnamon (q. v.) tree, growing in the Molucca Islands. It comes to market in pieces of various length, almost flat, thick, fibrous, covered with a white epidermis, reddish-yellow inside, and has an odour resembling that of nutmeg and cloves, and a pungent taste. It is useful in cases of indigestion, diarrhœa, &c.—Another variety of C. B. is believed to be the produce of *Cinnamomum xanthoneurum*; and a very similar bark, called Sintoc Bark, is obtained from *C. Sintoc*.

**CU'LLEN,** a royal, parliamentary, and municipal burgh and seaport in the north of Banffshire, 12 miles west-north-west of Banff. It is built on the west slope of an eminence overlooking the sea, and at the mouth of the Cullen Burn. Population of municipal burgh, 3165. A third of the inhabitants of the town are engaged in the cod, ling, haddock, skate, herring and salmon fisheries. C. contributes with Elgin, Banff, Peterhead, Inverury, and Kintore in returning one member to parliament. The chief exports are cured fish, oats, potatoes. Some linen is made. The Marquis of Montrose burned C. in 1645.

**CULLEN,** William, a well-known physician of the last century, and one of the most celebrated professors of medicine in the universities of Edinburgh and Glasgow, was born at Hamilton, in Lanarkshire, on the 15th day of April 1710. His father was factor to the Duke of Hamilton, and was possessed of a little landed property in the parish of Bothwell; he appears to have brought up two of his sons to the learned professions, and to have himself received a legal education. William C. received the first part of his education at the grammar-school of Hamilton, and afterwards began his medical studies in Glasgow by an apprenticeship, and by attending literary classes in the university. At this time (about 1727), it does not appear that there was any systematic medical teaching in Glasgow University, though the medical school of Edinburgh was just rising to the height of its fame, under the auspices of the first Monro. C.'s master in the art, however, Mr John Paisley, was a liberal and enlightened man, having a valuable library, of which the pupil may be presumed to have made good use. In 1729, having completed for the time his medical education, he was appointed surgeon to a merchant-ship, trading to the West Indies; and from this time till 1734, he was actively engaged in learning his profession practically in various situations, but without accepting any permanent responsibility. He next spent two additional winter-sessions in Edinburgh in the regular study of medicine, and was one of the founders of that important Students' Association—since called the Royal Medical Society—the object of which was, and is, the advancement of the medical knowledge of the members by periodical discussions on subjects of interest connected with medical study. In 1736, he commenced practice at Hamilton, and very soon was largely employed, having secured from the first the influence and friendship of the Duke of Hamilton and of other persons of distinction. Soon after, he became acquainted with William Hunter, afterwards the celebrated anatomist and obstetric professor, and brother of the still more celebrated John Hunter. See Hunter, John and William. The three years passed by Hunter under Cullen's roof formed the beginning of a life-long friendship, although after Hunter went to London, it is probable that they never again met. In 1740, C. took the degree of Doctor of Medicine in the university of Glasgow; in 1741, he entered into partnership with a surgeon, with the view of confining himself to a physician's practice; in 1744, he responded to the invitation of a number of families in Glasgow, and took a house in that city, an object which it is probable he had in view some years before, but which he was prevented from carrying out by the friendship and liberal patronage of the Duke of Hamilton, who died in 1743. Various circumstances indicate that during the seven years passed in practice in Hamilton, C. was diligently preparing, not only for the practice, but also for the teaching, of his profession; and accordingly, he had no sooner settled in Glasgow, than we find him engaged in giving a course of lectures, in regard to which his correspondence with William Hunter sufficiently shews that it was successful, and deserved success. Up to this period, though professorships of medicine, and of anatomy with botany, existed in the university, no lectures were delivered in either medicine or botany; and it seems certain that to C. that university owes the real commencement of its medical school; for in one or two years succeeding 1746, he made arrangements with the several professors to lecture on the theory and practice of physic, on botany and the materia medica, and finally on chemistry, being assisted in these last departments by Mr John Carrick, who also acted as assistant to the professor of anatomy. In botany, C. seems to have lectured in Latin, but in the other departments he adopted the English language as the vehicle of expression, an innovation of great importance, which permitted him to adopt a more familiar style of lecturing than had hitherto been in use. One of his original hearers records that 'in the physic class, Dr Cullen never read lectures, but only used notes; in the chemistry, he sometimes read, but very seldom.'[*]

He was supported by the university by votes

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[*] Thomson's *Life of Cullen*, vol. i. p. 25.

amounting to £136 for the chemical laboratory, and £20 annually for keeping it in repair. As a chemist, he does not appear to have made any notable discovery; but he imbued the minds of his pupils with large and liberal views of a science then very imperfectly studied, and was beyond all doubt the means of raising up the great reputation of Dr Black, by turning his thoughts to the subject of Latent Heat, which he prosecuted so successfully by a series of conclusive and most original experiments. In 1751, after somewhat prolonged negotiations, C. was placed, through the influence of the Duke of Argyle, for the first time in his rightful position as a professor in the university of Glasgow, in room of Dr Johnstone, the Professor of Medicine. But by this time it had begun to be apparent that an opening both for teaching and practice existed in Edinburgh, and Lord Kames, whose knowledge both of general science and of Edinburgh society placed him in a favourable position for judging of the chances of success, made several attempts to attract the rising and ambitious Glasgow professor to the metropolis; in which design, however, he was not successful till four years afterwards, when C. was elected by the town-council joint Professor of Chemistry with Dr Plummer, who had fallen into bad health, and who died about a year afterwards. In 1757, his ever-active mind found a new direction in adding to his duties as Professor of Chemistry the teaching of Clinical Medicine in the Royal Infirmary, a duty up to this period performed by Dr Rutherford only, the Professor of Medicine and Botany. The clear-sightedness and practical sagacity which he brought to this work at once fixed his position as a teacher and as a physician. Probably, also, the fact of his having to give bedside instruction at this period opposed itself to the natural tendency of his mind to give everything a systematic form, and weeded his method of practice of an immense quantity of the scholastic rubbish which appears prominently in all the medical learning of that age. He became a decided favourite with the students, and not less so with his patients; and in 1760 was applied to by the former to undertake the lectures on materia medica, in consequence of the death of Dr Alston during the session. This duty he performed so well, that his lectures were surreptitiously printed from the notes of a pupil, and had a considerable circulation. On the resignation of Dr Rutherford, it was reasonably expected that C. would have been transferred from the chemical chair to that of the Practice of Physic, for which he had shewn so decided an aptitude; but personal views interfered, and Dr John Gregory was appointed to the practical chair. In 1766, C. was, however, placed in the chair of Institutes of Medicine, vacant by the death of Dr Whytt; and Black, now the greatest chemical discoverer of the age, was brought to Edinburgh from Glasgow to fill C.'s place as Professor of Chemistry. In 1773, C. was at last transferred to the chair of the Practice of Physic, the duties of which he had for some years performed alternately with Dr Gregory, the latter taking part in return alternately with C. in the lectures on the Theory or Institutes of Medicine.

The rest of Dr C.'s biography is simply a record of continued success as a teacher and a practitioner. His popularity with his students, and even his scientific reputation at one time threatened to be seriously diminished by the brief but noisy episode of the Brunonian system (see Brown, John, M.D.). In 1778, C. became the proprietor of Ormiston Hill, a small but prettily situated property about eight miles west of Edinburgh, where he passed as much time as his professional duties would allow in improving his little estate, and renewing his long-dormant knowledge of, and love for, rural affairs. 'I have got upon my hobby,' he writes to a friend; 'my amusement is a little farm, and a little pleasure-ground. . . . . I have done a great deal, but it is all levelling work; other people cannot know what earth has been moved, but I have had some amusement in the turning of every shovelful.' It was a becoming end to a life of usefulness. He had here the leisure and the enjoyment of life which were required to wean him from the too exclusive pursuit of his profession; and while his love of science never chilled, and was even made subservient to the adornment of the retreat of his old age, he was somewhat withdrawn from the heat and the strife of the world into the purer air of domestic retirement. C. died on the 5th February 1790, having nearly completed his 79th year, and having been actively engaged in teaching and consulting practice till within a few months of his death. His most important works are—the *First Lines of the Practice of Physic* (Edin. 1777); *Synopsis Nosologiæ Methodicæ*, 1785; *Institutions of Medicine*, 1777; *A Treatise of the Materia Medica*, 1789. Their characteristics are great clearness of expression, with remarkable soundness of judgment and common sense, rather than striking originality, or a rapid advance into new regions of thought. But he was eminently the man for his time, which was distracted and confused by a host of baseless theories, and by many of those 'false facts' which C. himself said were more numerous than even false theories. Amid this farrago, he sought his way towards the truth with remarkable impartiality, and infinite candour as regards the opinions of others. His fame as one of the greatest of teachers has survived the memory of his professional success, and even the credit of his far-famed systematic Nosology. His writings have been collected, in 2 vols. 8vo, by Dr John Thomson (Edin. 1827), by whom also a Life was commenced, the first volume of which was published in 1832. This biography was continued by his son, and finally completed in a second volume by Dr Craigie, in 1859.

**CULLO'DEN**, or **DRUMMO'SSIE MOOR**, a desolate level tableland, now partly cultivated, in the north-east of Inverness-shire, six miles east-north-east of Inverness, near the Moray Firth. It is memorable as the scene of the total defeat, on 16th April 1746, of the Highland army under Prince Charles Stuart by the royal troops under the Duke of Cumberland, and the extinction of the hopes of the House of Stuart to regain the English crown. Green mounds and a monumental cairn mark the spots where the battle was fiercest, and where many of the slain lie buried.

**CULM**, in Botany, the peculiar cylindrical hollow and jointed stem of Grasses (q. v.).

**CULM**, a popular name of Anthracite (q. v.), in very general use in some parts of England, and occurring in many scientific works. In some districts of South Wales, the C., obtained from the pits in a broken and crumbling condition, is used as fuel, being made up into balls, with one-third of its bulk of wet viscid clay. It burns without flame, producing a strong and steady heat, well adapted for cooking.

**CULMINA'TION**, an astronomical term, signifying the passage of a star across the meridian. The star is then at the highest point (*culmen*) of its course: hence the name. The sun culminates at mid-day, or twelve o'clock, apparent solar time—which seldom agrees exactly with mean time, as shewn by a watch or clock. The full moon culminates at midnight. The time of C. of a fixed star is always exactly midway between the times of its rising and setting; in the case of the sun, moon, and planets, it is only nearly so.

**CU'LPA** (Lat. fault, crime, blame). By the Roman jurists, C. was recognised as existing in three degrees: *C. lata*, gross carelessness or omission, which was regarded as equivalent to dole; *C. levis*, that degree of negligence into which a person attentive to his own affairs may be supposed occasionally to fall; and *C. levissima*, that still more slight degree of negligence which is in some degree incident to human nature, and may be fallen into by even the most prudent and sharp-sighted. Where a contract contemplates the mutual benefit of both parties, the middle degree of diligence is all that either is bound to exercise, and the neglect of this is *C. levis*, or C. simply. Where one party only is benefited, he is bound to exercise the utmost diligence, the neglect of which is *C. levissima*, whilst the other party has done enough if he avoids *C. lata*, or gross and excessive negligence. These distinctions of the Roman law have been adopted by the law of Scotland.

**CU'LPABLE HO'MICIDE.** See HOMICIDE and MURDER.

**CU'LPRIT**, in English law, is a prisoner accused, but not tried. After trial, if not acquitted, he becomes a convict.

**CULRO'SS**, a parliamentary and municipal burgh and seaport in a detached part of Perthshire, on the north shore of the Firth of Forth, 6 miles west of Dunfermline, and 22 north-north-west of Edinburgh. It is a place of great antiquity. As early as the 6th c., it was the seat of the monastery of St Serf, who afterwards became the patron saint of the town, where his yearly festival was kept till about the close of the 18th century. Ængus the Keldee, an Irish martyrologist, who wrote about 800 A. D., describes it as lying in Strathearn, between the Ochils and the Sea of Gindan, i. e., the Firth of Forth. It stands on the face of a hill rising from the shore. The parish church preserves some remains of the conventual church of a Cistercian abbey, founded in 1217, on a commanding site in the higher part of the town. Close beside it is the fine old residence of C. Abbey, founded by the Bruces of Carnock and Kinloss about the end of the 16th c., remodelled about the middle of the 17th c., and towards the end of the 18th occupied by the father of the late Lord Dundonald, who here made experiments in extracting tar from coal for preserving ships' bottoms, and gas for illuminating purposes. At the east end of the town are the ruins of a chapel, built about the beginning of the 16th c., in honour of St Kentigern or Mungo, who is said to have been born here about the year 500, and to have been here educated by St Serf. C. has various charitable institutions, and carries on some damask weaving. In the 16th c. it was famous for the manufacture of salt and the export of coal, as well as for the manufacture of iron 'girdles' for baking oat-cakes. Pop. 605. It returns one member to parliament with Stirling, Dunfermline, Inverkeithing, and South Queensferry. From James VI.'s time, up till the beginning of this century, coal-mines were worked here far under the Firth of Forth.

**CU'LTIVATED PLANTS**—those plants which, either for their usefulness or their beauty, have been to some considerable extent, and not merely as objects of curiosity, cultivated by man—belong to natural orders widely different from each other, and scattered throughout almost all parts of the vegetable kingdom. The prevalence of particular qualities in particular natural orders, indeed, causes us to find groups of C. P. in some of them, as the *Cerealia* or corn-plants among grasses; but with these are botanically associated other species—usually far more numerous—to which no great value has ever been attached, or which are objects of interest to the botanist alone. It may be that, in some instances, the original preference of certain species was accidental, and that their present superiority over certain others is merely owing to the improvements effected by cultivation; but we are no more entitled to assume that this has been ordinarily the case, than that man has in his selection exhausted, or nearly exhausted, the resources of nature. Some plants are known to have been cultivated from the most remote historic ages; some have but recently become the objects of human care, which yet are deservedly esteemed; and, in some instances—e. g., sea-kale—these have not been introduced from regions newly explored, but are natives of the very countries which have been the seats of ancient civilisation. Probably, in the earliest ages, plants useful for food alone were cultivated, and of these only a few kinds, as is still the case among savage tribes; it may perhaps be doubted whether plants yielding fibre for clothing and cordage, or plants from which alcoholic beverages or narcotics could be procured, were most likely next to engage attention.—Of C. P., plants affording articles of human food are certainly the most important, as well as the most numerous class. See FOOD. Next to these may be ranked plants yielding FIBRE (q. v.). Other important classes of C. P. are those yielding alcoholic beverages, all of which, however, are also to be ranked among the plants yielding food (see FERMENTED LIQUORS); those yielding tea, coffee, cocoa, and other similar beverages, containing *Caffeïne* (q. v.), or some analogous principle; those yielding Narcotics (q. v.), as tobacco and opium, some of which are and some are not cultivated also for other purposes; those yielding Dye-stuffs (q. v.); those yielding medicines (see OFFICINAL PLANTS); those yielding fixed oils (see OIL-PLANTS), some of which are to be reckoned among plants valuable for food, on account of the use of their oils as articles of food, whilst they are also valuable on other accounts; those yielding Fodder (q. v.) for cattle; those yielding timber (see TIMBER TREES); those employed for Hedges (q. v.), &c. There are also many miscellaneous useful products of plants, and useful purposes to which they are applicable. Among the former are resins, turpentines, essential oils, gum, caoutchouc, gutta-percha, bark for tanning, &c.; among the latter, the thatching of roofs, basket-making, and the supply of food necessary for useful insects, which leads to the cultivation of the white mulberry as the food of the silkworm, and of the cochineal cactus or nopal as the food of the cochineal insect. Many plants highly valued for their usefulness are still scarcely or not at all cultivated: this is the case particularly with many that yield medicines, for which the whole demand is not too great to be easily supplied by the plants growing wild, and with timber trees, the plantation of which only takes place in countries of very advanced civilisation. The number of plants cultivated for their usefulness is continually increasing, as well as of those cultivated for their beauty. The cultivation of flowers and ornamental shrubs and trees, although unquestionably less ancient than that of some of the plants most necessary for the supply of urgent wants, nevertheless dates from a remote antiquity, and has always existed in every country entitled in any measure to the credit of civilisation. Some C. P. have from a very early period been very widely diffused, as has particularly been the case with some of the corn-plants; but others have been confined to particular regions through no necessity of climatic adaptation, but rather from want of intercourse among nations. Thus, some of the finest ornaments of our greenhouses and gardens, recently introduced into Europe, have been diligently cultivated from time immemorial in China and Japan, in which countries also many useful plants are cultivated still almost unknown in other parts of the world. The cultivation of useful aquatic plants is practised in China to a degree unapproached in any other country.

The changes produced by cultivation present an interesting and difficult subject to the student of vegetable physiology. Increase of luxuriance and size is a result which might have been expected from abundant nutriment and favourable circumstances of growth; but the determination of the strength of the plant in its vegetation to particular parts, and their greater proportionate increase, is a more remarkable phenomenon, although of common occurrence, as is also the considerable modification of juices and qualities. To these effects of cultivation, perpetuated in the progeny of the plants, and increased from one generation to another, we owe many of the most useful varieties of cultivated plants. Our cabbages, turnips, carrots, &c., differ very much from the wild plants of the same species; there is little, for example, that is eatable or nutritious in the root of a wild turnip, and the acridity occasionally to be observed even in cultivation exists in it to a much greater degree. Wild celery is poisonous, or almost so. How far the effects of cultivation can be extended, is a question not yet decided in general, nor with reference to particular species.

**CULTIVA'TION.** The term includes all operations for preparing the soil for those crops which man specially selects for his use. The spade, the hoe, and the plough, have been the primary implements of C. among all nations as far back as their civilisation can be traced. All these effect much the same end. By their means the soil is stirred and inverted, which keeps under the vegetation that is supplanted, and loosens the soil to admit of the roots of the sown plants to run through it. The harrow or rake, on the other hand, is employed to smooth the surface and cover the seed. To allow of the C. of the crops when they are growing, in many cases the seeds are planted or sown in rows. Cereals, for instance, are, with this view, often sown with a *drill* in rows from six to nine inches apart; and the narrow rows are either cultivated by the *hand* or *horse hoe*. Again, turnips, potatoes, and other green crops are sown at wider intervals, from 24 to 30 inches, and are cultivated during their growth by horse-hoes of various descriptions. The implements used in C. will be best treated under their special names, and under the different crops the peculiarities of their cultivation will be considered. A few general principles, however, which ought to be kept in view in the C. of all crops, may be here stated.

The soil, in the first place, should be as completely inverted as possible, since it is an important object to smother or bury the surface-plants, and permit them to decay within the soil and yield food for the plants to be sown. In the second place, it should be rendered as loose and comminuted as possible; for earth in this state both allows an excess of water to pass through it more easily, and it also retains a larger supply within it for the wants of vegetation when the weather is dry. Land that is tilled in autumn may be left open, rough, and cloddy, as the frost of winter will loosen and pulverise it by spring. In a dry and warm climate, the desired state of the soil is secured by abundant ploughing, rolling, and other operations. In a wet and moist climate, these must be more sparingly resorted to, as a moderately rough mould facilitates the draining away of excessive rains, and prevents the soil from becoming consolidated by such excess.

**CULTIVA'TOR**, a farm implement. See GRUBBER.

**CULTRIRO'STRÉS** (Lat. knife-billed or ploughshare-billed), a tribe of birds of the order *Grallatores;* distinguished by a long, thick, stout, and generally pointed and trenchant bill, and containing Cranes, Herons, Bitterns, Storks, Adjutants, &c.

**CU'LVERIN**, among the earlier forms of cannon, was a very long gun. It was generally an 18-pounder, weighing 50 cwt.; the *demi*-C. was a 9-pounder, weighing 30 cwt. A C. of especially large dimensions is still in existence at Dover Castle, where it is known by the name of Queen Elizabeth's Pocket Pistol.

**CU'LVERT** is the name given to an arched channel of masonry for the conveyance of water underground.

**CU'MÆ**, an ancient city on the coast of Campania, founded conjointly by colonists from Chalcis in Eubœa, and from Cymæ in Asia Minor. According to Strabo, it was the earliest of all the Greek settlements either in Italy or Sicily, but the precise date of its foundation is a matter of dispute. It soon attained to wealth and power, built several harbours or port-towns of its own, kept a tolerably large fleet, extended its influence over the native tribes of the neighbouring territories, planted a colony at Neapolis (Naples), and for 200 years (700—500 B.C.) was indisputably the most important and civilised city in Southern Italy. Subsequently, it was repeatedly but unsuccessfully attacked by the Etruscans and Umbrians. In 474 B.C., its ally, Hieron, king of Syracuse, defeated the combined fleets of the Etruscans and Carthaginians, who had attacked it by sea. Yet there can be no doubt that these conflicts both lessened its resources and weakened its influence, for in 420 B.C., the Samnites conquered the city, murdered or enslaved the most of the citizens, and forcibly married their wives and daughters. A Samnite colony was now established in C., which rapidly degenerated into a second-rate Campanian town. In 338 B.C., it was admitted to the Roman franchise, and from this period steadily adhered to the fortunes of Rome. In the second Punic war, Hannibal tried to capture it, but was repulsed by Sempronius Gracchus. Towards the close of the republic, it became the municipal capital of the district in which the Roman nobles had their villas and sea-coast residences. It continued to exist as a 'quiet' place down to the close of the Roman empire, but re-assumed a momentary importance during the wars of Belisarius and Narses. Its strong fortress, garrisoned by the Goths, was the last place in Italy that held out against the Byzantine army. Few remains of the ancient city exist. —C. is famous as the residence of the Sibyl (q. v.), whose cave—a vast subterranean grotto hewn out of the eastern side of the rock on which stood the citadel—is described by Justin Martyr, who visited it. It was destroyed by Narses in a vain attempt to undermine the fortress.

**CUMAÑA'**, the oldest European city in the new world, having been built by Diego Castellon in 1521, and originally named New Toledo. It is in the province of Venezuela, South America, and stands, at the mouth of the Manzanares, on the Gulf of Cariaco, a long and narrow arm of the Caribbean Sea. Lat. 10° 30′ N., and long. 64° 15′ W. Though it was almost entirely destroyed by an earthquake in 1853, yet it is said still to number, including several suburbs, 8000 inhabitants. It has a good roadstead, which is commanded by a fort on an adjacent height. It has but few edifices of any note, for the houses, in order to guard against the evil already mentioned, are generally low built. It carries on a tolerably large export trade in cattle, smoked meat, salt-fish, cocoa, and other provisions.

**CUMANA**, the department of which the above-mentioned city is the capital, forms the most easterly section of the northern coast of the republic, touching the Orinoco on the south, and meeting Caracas on the west. Besides the capital, it comprises the city of Barcelona, and the towns of Cariaco, Carapano, Aragua, and El Pao.

**CU'MBERLAND**, the north-westmost county of England, bounded N. by Scotland and the Solway Firth, W. by the Irish Sea, S. by Lancashire, E. by Westmoreland, Durham, and Northumberland. It is 11th in size of the English counties; greatest length, 74 miles; greatest average breadth, 22; 75 miles of coast: area, 1523 square miles; $\frac{2}{3}$ being cultivated, and $\frac{1}{3}$ in mountain and lake. The surface is mountainous in the south-west and east; the middle consists of hills, valleys, and elevated ridges; and the north and north-west districts, including the vale of Carlisle, are low, flat, or gently undulated. The mountains in the south-west are high, rugged, and sterile, with deep and narrow valleys, lakes, rivers, waterfalls, and woodlands. The chief mountains are Sca Fell Pike, 3166 feet; Sca Fell, 3100; Helvellyn, 3055; Skiddaw, 3022. From the latter are seen the German Ocean and the Irish Sea. The Pennine chain, the great backbone of the north of England, skirts the north-east border of C., and rises in Cross Fell, 2901 feet. C. has 15 lakes, the largest one, Ulleswater, being 9 miles by 1. Six of the chief waterfalls are 60 to 156 feet high. The chief rivers are the Eden, running 35 miles north-west into the Solway Firth; the Esk, running south into the same; and the Derwent, which collects the water of six lakes and several tarns, and runs 33 miles north-west and north into the Irish Sea. The great west or Carlisle and Lancaster railway route from Edinburgh to London, crosses the north-east part of Cumberland.

The Lake district, or nearly the south-west half of C., consists of Silurian slates, with protrusions of granite and trap rocks, and with new red sandstone along the coast south of St Bees Head. In the north is a semicircular strip of carboniferous limestone; then follow strips of coal strata and Permian rocks; then the new red sandstone plain of Carlisle, with carboniferous limestone on the north-east, including a trap-dike 30 miles long, parallel to and on the east side of the Eden, and crossing to the west near Ainstable. C. abounds in mineral wealth—silver, copper, lead, iron, plumbago, gypsum, limestone, coal, slates, marbles, marl, and several of the more rare minerals.

In the mountainous parts, the climate is cold, wet, and variable, especially from July to October; on the coast, it is mild. There is a fall of 50 inches of rain annually at Whitehaven, and of 68 at Keswick; while at some places among the mountains the fall sometimes reaches 100 inches. Half of the cultivated soil consists of dry loam. Much of the subsoil is wet clay. The chief crops are wheat, barley, oats, turnips, and potatoes. There are many small dairies. Many sheep and cattle are reared in the mountains. The estates are generally small, and farmed by the owners, or held under the lords of the manors by customary tenure. Many of the small or peasant proprietors have had their lands in their families for centuries, and have a high spirit of independence. There are manufactures of woollens—much being domestic—cottons, linen, earthenware, and glass. C. is divided into five wards or hundreds, 104 parishes, and nine poor-law unions. The chief towns are Carlisle, Cockermouth, Whitehaven, Workington, Maryport, Wigton, Penrith, Keswick, Egremont. In 1851, pop. 195,492; 563 schools, with 25,493 scholars; 389 churches (161 being Episcopal and 136 Wesleyan Methodist). C. returns nine members to parliament—four for the county, two for Carlisle, two for Cockermouth, and one for Whitehaven. C. formed part of Cumbria (q. v.). Many Roman relics have been found, such as altars, inscriptions, coins, instruments, utensils. During Saxon times, it was under Danish law. Henry III. united it to England. For three centuries before the union of England and Scotland, C. was the constant scene of war and devastation, from incursions of the English and Scotch into this, a debatable tract between the two kingdoms. It was again devastated in the civil wars of the 17th c., and in 1715 and 1745. C. had formerly several monasteries and hospitals; and on the borders, many towers or peel houses; and it has still some old Norman and Gothic churches.

**CUMBERLAND**, a river, rises in Kentucky, United States, and after a course of 600 miles, of which the lower half is navigable for vessels of 400 tons, enters the Ohio at Smithland from the left, a few miles above the point where the Tennessee also joins the Ohio from the same side.

**CUMBERLAND**, Dr Richard, was born in London, July 13, 1632. Educated at St Paul's School and at Cambridge, he was appointed to the rectory of Brampton, Northamptonshire, in 1658; and in 1667, to the living of All Hallows, Stamford. About 1692, the bishopric of Peterborough was bestowed upon him, its occupant, prior to the Revolution, having refused to take the new oath. C. was a man of great acquirements and piety. He was the author of several works, but he is now chiefly remembered on account of his *Inquiry into the Laws of Nature* (published in Latin, but afterwards translated), a production of substantial merit, issued in reply to the moral and political works of Hobbes; and his *Essay on Jewish Weights and Measures*. As an instance of his great application and his insatiable thirst for knowledge, it is mentioned that he learned Coptic after the age of 83. He died October 9, 1718.

**CUMBERLAND**, Richard, a dramatic writer and essayist, was born on the 19th February 1732, in the lodge of Trinity College, Cambridge. He was the great-grandson of the Bishop of Peterborough, and grandson, by the mother's side, of Dr Richard Bentley. He was placed at the public schools of Bury St Edmunds and Westminster, and at the age of 14, was entered at Trinity College, Cambridge, where he took his degree in his 18th year, and two years after was elected fellow. It was C.'s intention to enter the church, but on being appointed private secretary to the Earl of Halifax, he relinquished all views of entering the sacred profession. When, in 1760, his patron became Lord-lieutenant of Ireland, C. removed to that kingdom. Passing through several subordinate offices, he was appointed secretary to the Board of Trade, and held that office till 1782, when the Board was suppressed. Having obtained a compensation allowance, C. retired to Tunbridge Wells. Here he devoted himself to literature, and wrote farces, tragedies, comedies, pamphlets, essays, and novels. Many of his comedies were successful at the time of their appearance, although they have not kept possession of the stage. C. is best known to fame as an essayist, and as a translator from the Greek poets. His memoirs were published in 1806, and he died, after a few days' illness, on the 7th May 1811.

**CUMBERLAND ISLAND** forms a large, but somewhat indefinite portion, of that coast of Davis Strait which lies between Hudson's Strait and Lancaster's Sound.

**CUMBERLAND PRESBYTE'RIANS**, a religious denomination which sprang up in 1810 in the state of Kentucky, in North America, in consequence of a dispute between the presbytery of Cumberland in that state, and the Kentucky Synod of the Presbyterian Church in America, concerning the ordination of persons who had not passed through the usual educational curriculum, but whose services the presbytery regarded as demanded for the ministry by the exigencies of the times. It now reckons more than 1200 congregations and about 100,000 members. Its doctrines and government agree with those of the other branches of the Presbyterian Church, except that the doctrine of universal redemption is held, and the predestination of sin denied.

**CU'MBRAYS**, or **GREAT AND LITTLE CUMBRAY**, two small isles in the Firth of Clyde, between Bute Isle and Ayrshire, and included in the county of Bute. They consist of old red sandstone, with trap-dikes intersecting it. Great Cumbray lies three miles east of Bute, is 3½ miles long by two broad, has a population of 1266, contains Millport and Newton villages, and is a great summer resort of the inhabitants of Glasgow. Little Cumbray lies nearly a mile to the south of Great Cumbray, is one mile long by half a mile broad, and rises 780 feet, it contains many caves excavated by the sea in the stratified rocks.

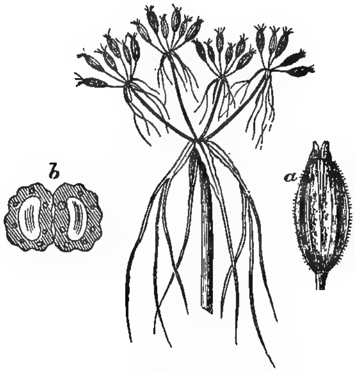
**CU'MBRÉ, LA**, the Spanish for top or height, is one of the principal passes across the Andes, on the high road between Santiago in Chili and Mendoza in the Argentine Republic. The altitude of its crest is 12,454 feet, fully one half more than the elevation of the pass of the Great St Bernard in the Alps. The lat. and long. are 33° S. and 70° 20′ W.

**CU'MBRIA**, an ancient British principality, comprising Cumberland in England, and that part of Scotland which is now divided into the shires of Dumbarton, Renfrew, Ayr, Lanark, Peebles, Selkirk, Roxburgh, and Dumfries. It was governed by its own kings—who had their seat at Dumbarton, Glasgow, and elsewhere—until about the middle of the 10th c., when it became a tributary principality held of the king of the English, by the heir of the king of the Scots. See the article BRETTS AND SCOTS.

**CU'MBRIAN MOUNTAINS**, a great knot of mountains, nearly 50 miles in length and breadth, in the north-west of England, occupying part of Cumberland, Westmoreland, and Lancashire. This tract, the English Lake district, has much of the physical character of Wales, and being unsurpassed in the British Isles for picturesqueness and beauty, it is much frequented by tourists. The central and southern parts consist of Silurian, granite, and trap rocks, rising in lofty rugged mountains, which enclose deep valleys and large lakes. There are 25 mountain-tops upwards of 1500 feet high, including Sca Fell Pike, 3166 feet; Sca Fell, 3100; Helvellyn, 3055; and Skiddaw, 3022. Four passes cross these mountains at the height of from 1100 to 1250 feet. The deep valleys between the mountains contain 14 lakes, 1 to 10 miles long. The largest of the lakes are Windermere, Ulleswater, Conistone Water, Bassenthwaite Water, and Derwentwater. A semicircular strip of carboniferous limestone skirts the north of the Silurian tract. On the higher C. M., snow lies six or eight months in the year, but on the neighbouring coasts rarely above a few days. Many eminent persons have resided among the lakes, the beauty of which has inspired some of the finest writings of Wordsworth, Coleridge, Southey, Professor Wilson, De Quincey, Arnold, and Harriet Martineau.

**CUMIA'NA**, a town of Piedmont, 7 miles north of Piñerolo, near the right bank of the Cisola. Pop. 5700.

**CU'MMIN**, or **CU'MIN** (*Cumīnum*), a genus of plants of the natural order *Umbelliferæ*, containing only one known species (*C. cymīnum*), a native of Egypt and the neighbouring countries; an annual, with branched stem, much divided thread-like leaves, general and partial involucres resembling the leaves, umbels of small white or pink flowers, and fruit about two lines long. The fruit (seeds) has an odour resembling that of caraway, but stronger and less pleasant. It is employed as a carminative in many parts of the world; in Germany, it is often put into bread; in Holland, sometimes into cheese. It is also used in medicine, particularly with resin for discutient plasters, but its use is now chiefly confined to veterinary practice. It contains a peculiar volatile oil (*Oil of Cummin*). C. is cultivated in the south and middle of Europe, India, &c. C. seed is brought to Britain mostly from Sicily and Malta.—The fruit of *Lagoecia cuminoides*, another umbelliferous plant, a native of the Levant, is similar in its qualities and uses to that of cummin. The BLACK C. of the ancients is believed to be a species of *Nigella* (q. v.). Both are perhaps included in the name C. in Scripture.



Cuminum Cyminum:
*a*, fruit; *b*, section of fruit.

**CU'MMING, REV. DR JOHN**, a popular preacher of the day, was born in Aberdeenshire, 10th November 1810, educated at King's College, Aberdeen, where he took his degree of M.A. in 1827, and, in 1833, was ordained to the Scotch Church, Crown Court, Covent Garden, London, where he still officiates. His popularity as a preacher is very great, especially among 'fashionable' circles. In 1837, C. made his first prominent appearance in public in connection with the Voluntary controversy between Drs Wardlaw and Chalmers. His views were strongly in favour of establishments. Since then he has figured prominently on the platform, particularly as the 'champion' of the anti-popery class of Protestants. But the chief source of his popularity is his gift of apocalyptic interpretation. His exposition of the Book of Revelation is not very convincing to men who are moderately impressed with the grandeur, complexity, and mystery of the Divine Providence; but it is greatly relished, and greedily swallowed by that large portion of the community who love to see all things, even the 'oracles of God,' presented under melodramatic aspects.

C.'s works are very voluminous: the chief are *Voices of the Night*, *Voices of the Day*, *Voices of the Dead*, *Apocalyptic Sketches*, and *Expository Readings in the Old and New Testament.*

**CU'MNOCK**, OLD, a town in the south-east of Ayrshire, on the left bank of Lugar Water, and on the Glasgow and Dumfries Railway, 16 miles east of Ayr, in the middle of the district of Kyle. Pop. of town, 2395; of parish, 3777. It was once famous for the manufacture of wooden snuff-boxes, with 'invisible wooden hinges,' 2500 to 3500 being made yearly, but this business has for many years been almost wholly in the hands of the Mauchline manufacturers. Around Old C. there is an abundant supply of good coal, and of rich iron ore. It has also manufactures of reaping and thrashing-machines, and other agricultural implements. New Cumnock is a village 5 miles south of Old C., amid the high lands in the upper part of Kyle district. Pop. of parish, 2759. Near New Cumnock are found ironstone, antimony, smiths' and cannel coal, and plumbago.

**CU'MYN, CUMMING**, or **COMYN**, a family which rose to great power and eminence in England and Scotland. It took its name from the town of Comines, near Lille, on the frontier between France and Belgium. While one branch remained there, and in 1445, gave birth, in its old château, to the historian Philippe de Comines (q. v.), another followed the banners of William of Normandy to the conquest of England. In 1069, the Conqueror sent Robert of Comines, or Comyn, with 700 horse to reduce the yet unsubdued provinces of the north. He seized Durham, but had not held it for 48 hours, when the people suddenly rose against him, and he perished in the flames of the bishop's palace. His nephew, William, became Chancellor of Scotland about 1133, and nine years later, all but possessed himself of the see of Durham. The chancellor's nephew, Richard, inherited the English possessions of his family, and acquired lands in Scotland. By his marriage with Hexilda, Countess of Athol, the granddaughter of Donald Bane, king of the Scots, he had a son William, who, about 1210, became Earl of Buchan by marrying the Celtic heiress of that great northern earldom. By this marriage, he was father of Alexander, Earl of Buchan, who, by marrying a daughter of Roger de Quenci, Earl of Winchester, acquired the high office of Constable of Scotland, with great estates in Galloway, Fife, and the Lothians. By a previous marriage with a wife whose name has not been ascertained, William C. was father of Richard—whose son John became Lord of Badenoch—and of Walter, who by marriage became Earl of Monteith. By other marriages, the family obtained, for a time, the earldom of Angus and the earldom of Athol, so that, by the middle of the 13th c., there were in Scotland 4 earls, 1 lord, and 32 belted knights of the name of Cumyn. Within 70 years, this great house was so utterly overthrown that, in the words of a contemporary chronicle, 'there was no memorial left of it in the land, save the orisons of the monks of Deer' (a monastery founded by William C., Earl of Buchan, in 1219). The Cumyns perished in the memorable revolution which placed Bruce on the throne of Scotland. Their chief, the Lord of Badenoch, had, in 1291, been an unsuccessful competitor for the crown, as a descendant, through king Donald Bane, of the old Celtic dynasty. His son, Red John C., was one of the three wardens of Scotland, and distinguished himself by his gallant resistance to the English. He fell under Bruce's dagger, before the altar of the Franciscan friars at Dumfries, in 1306; and his kindred went down, one after another, in the struggle to avenge him. John C., Earl of Buchan, was defeated by Bruce in a pitched battle, near Inverury, in 1308, when his earldom was wasted with such relentless severity, that—we are told by the poet who sang the victories of Bruce—for sixty years afterwards, men mourned the desolation of Buchan. Such of the Cumyns as escaped the sword, found refuge, with their wives and children, in England, where, although they were so poor as to be dependants on the bounty of the English court, they married into the best families, so that, in the words of Mr Riddel, 'their blood at this day circulates through all that is noble in the sister kingdom, including the numerous and royal descendants of King Henry IV.' The Earl of Shrewsbury seems to be the representative of the Lord of Badenoch, who was the head of the race.

**CUNA'XA**, a place in Babylonia, on the eastern bank of the Euphrates, about forty-five miles north from Babylon, noted for the battle fought there (401 B.C.) between Cyrus the Younger and his brother Artaxerxes Mnemon, in which the former was killed.

**CUNDINAMA'RCA**, the central department of New Granada, or at least of what lately existed under that name, comprises the provinces of Mariquita, Neyva, and Bogota. It occupies large portions of the basins of the Magdalena and the Cauca, having an estimated area of 350,000 square miles. The population, of which we can only guess the amount, appears to be equally divided between whites, aborigines, and half-breeds. Within the province of Bogota stands the city of the same name, once the capital of Colombia, and still the capital, at least nominally, of New Granada. Pop. 517,648. C. derives its name from an old American goddess, and before the conquest of the land by the Spaniards was one of the chief regions of native civilisation. There are still to be met with here, ruins of old buildings, broken statues of the gods, and other monuments of a worship that has wholly passed away.

**CUNE'IFORM**, Cuneatic, Wedge-shaped, Arrow-headed, (Fr. Tête-à-clou, Ger. Keilförmig), are terms for a certain form of writing, of which the component parts may be said to resemble either a wedge, the barb of an arrow, or a nail. It was used for monumental records, and was either hewn or carved in rocks and sculptures, or impressed on tiles and bricks. The first date that can be assigned to it is about 2000 B.C., and it seems to have died out shortly before or after the reign of Alexander the Great. It appears to have been employed first in Assyria and Media, and to have thence spread over the whole of that vast portion of Asia which formed the Persian monarchy under the Achæmenidæ. For nearly 2000 years after its extinction its very existence was forgotten. Although the immense ruins found all over that ancient kingdom, and principally those of splendid palaces and tombs, which, at a distance of about 12 miles from Shiraz, designate the site of ancient Persepolis, had at all times attracted the attention of Eastern travellers, still no one seems to have dreamed that those strange wedges which completely covered some of them could have any meaning. It was Garcia de Sylva Figuëroa, ambassador of Philip III.

of Spain, who, on a visit to Persepolis in 1618, first became possessed with the firm conviction that these signs must be inscriptions in some lost writing and, perhaps, language, and had a line of them copied. Amongst subsequent travellers whose attention was attracted to the subject, Chardin, after his return to Europe in 1674, published three complete groups of cuneiforms, copied by himself at Persepolis, together with a comparatively long and minute account of the mysterious character. He likewise declared it to be 'writing and no hieroglyphs: the rest, however, will always be unknown.' Michaux, a French botanist, sent, in 1782, an entire altar, found at Bagdad, to Paris, covered with inscriptions, and bearing a large wedge—evidently an object of worship—on its top. Ever since, the materials for the investigation of a subject, the high importance of which by that time was fully recognised, have been rapidly accumulating. Sir H. Jones, Ker Porter, Robert Stewart, Sir W. Ouseley, Bellino, Dr Schultz—up to Rich and Botta, Flandin, Rouet, Layard, Oppert, and, above all, Rawlinson, each in his turn brought back more or less valuable materials from his eastern travels; and, naturally enough, those explorers are among the foremost to engage in the study of the records they had brought to light.

Shrouded in comparative mystery though certain portions of these characters and the language they represent still be, it is highly interesting and instructive to notice the opinions first entertained of them by the wise and learned in Europe. In the Transactions of the Royal Society of June 1693, they first appeared from a copy made by Flowers, and they are held to be 'the ancient writing of the Gaures or Gebres, or a kind of *telesmes*'—an expression no less unintelligible than the subject it tries to explain. Thomas Hyde, the eminent Orientalist, declared them, in his learned work on the religion of the ancient Persians, which appeared in 1700, to be nothing more or less than idle fancies of the architect, who endeavoured to shew how many different characters a certain peculiar stroke in different combinations could furnish, and reproved the authors of all those 'so-called Persepolitan inscriptions' very strongly for having misled so many wise men, and taken up so much of his own precious time. Witte, in Rostock, saw in them the destructive work of generations upon generations of *worms*. Generally, they were pronounced to be talismanic signs, mysterious formulæ of priests, astrological symbols, charms, which, if properly read and used, would open immense vaults full of gold and pearls—an opinion widely diffused among the native *savans*. The next step was to see in them a species of revealed digital language, such as the Almighty had first used to Adam. Lichtenstein read in some of them certain passages from the Koran, written in Cufic, the ancient Arabic character; in others, a record of Tamerlane; and was only surprised that others should not have found this, the easiest and clearest reading, long before him. Kæmpfer was not quite sure whether they were Chinese or Hebrew characters. That they were Runes, Oghams, Samaritan, Greek characters, were some of the soberest explanations.

It was Karsten Niebuhr who first shewed the way, to the more sensible portion of the learned, out of this labyrinth of absurdities. Without attempting to read the character itself, he first of all established three distinct cuneiform alphabets instead of one, the letters of which seemed to outnumber those of all other languages together. The threefold inscriptions found at Persepolis he thus took to be transcripts of the same text in three alphabets, in a hitherto unknown language. Tychsen of Rostock (1798), and Münter of Copenhagen (1800), affirmed and further developed this conjecture. The latter went so far as to divide the characters and inscriptions into alphabetical, syllabic, and monogrammatical, and to assume two different languages—Zend for inscriptions of a religious, Pehlvi for those of a political character. The real and final discovery, however, is due to Grotefend of Hanover, and dates from 1802. On the 7th of September of that year, he laid the first cuneiform alphabet, with its equivalents, before the Academy of Göttingen—strangely enough, in the very same sitting in which Heyne gave an account of the first reading of hieroglyphs. The process by which Grotefend arrived at that wonderful result is so supremely interesting, that we cannot omit to sketch it briefly. He fixed upon a Persepolitan inscription of what was called the first class, and counted in it thirty promiscuously recurring groups or combinations of cuneiforms. These groups he concluded to be letters, and not words, as a syllabarium of thirty words could not be thought of in any language. Then, again, a certain oblique wedge, evidently a sign of division, which stood after three, four, five, up to eight or nine such groups or letters, must shew the beginning or end, not of a phrase, but of a word. Tychsen and Münter had already pointed out a certain combination of seven characters as signifying the royal title. Grotefend adopted this opinion. The word occurred here and there in the text, and after the first words of most of the inscriptions, twice; the second time with an appendage, which he concluded to be the termination of the genitive plural, and he translated these two words, without regard to their phonetic value, 'King of Kings.' He then, in comparing the words preceding the royal titles in two tablets, found them repeated in what he assumed to be a filial relation; thus: There were three distinct groups, words, or names, which we will call X, D, and H, and this is how they occurred: 1, X, King of Kings, son of D, King of Kings; 2, D, King of Kings, son of H; but the 3, H, was *not* followed by the word King. H, therefore, must have been the founder of the dynasty. Now the names themselves had to be found. Grotefend, unlike his predecessors, had no recourse to philology, but to archæology and history. The inscriptions in question were by that time proved to belong to the Achæmenian dynasty, founded by Hystaspes = group H. He was followed by Darius, 'King of Kings, son of Hystaspes,' or Darius Hystaspis = group D; he, again, by Xerxes, King of Kings, son of Darius, King of Kings = group X—and the problem was solved. It could not have been Cyrus and Cambyses, as the groups did not begin with the same signs (C); nor Cyrus and Artaxerxes, the first being too short for the group, the second too long—it could only be Darius, Xerxes, Hystaspes—of course, in the orthography of their, not of our time; and wherever in these names the same letters recurred, they were expressed by the same combinations of signs. A further proof of the correctness of the reading was furnished by a vase in Venice, bearing a cuneiform and a hieroglyphical inscription, which were both read at the same time independently: 'Xerxes.' Innumerable difficulties, however, remained, and remain up to this moment. Grotefend had, after all, only read—and not altogether correctly—three names, which did not contain more than twelve letters—the rest being mere conjecture—and there were many more in this alphabet. The two other alphabets, with an infinite variety of letters, had hardly been properly approached yet. Moreover, the discovery of Grotefend was in itself so startling, so extraordinary and bold, that no one ventured to follow it up for the next 20 years, when

H. Martin found the grammatical flexions of the plural and genitive case. We cannot now specify his further discoveries, or those of Rask, Burnouf, Lassen, Westergaard, Beer, Jacquet, and others who followed; we will only say, that they mostly secured for themselves fame and name by rectifying or fixing one or two letters. The last and greatest of investigators of this first alphabet is Rawlinson, who not only first copied, but also read, the gigantic Behistun inscription—containing more than 1000 lines—of which more anon.

We now proceed to give what may be called the results of the investigations of the cuneiform character in general, up to this present moment; but we must warn the reader beforehand, that though much has been done, more remains to be done, and that a few years may change the whole aspect of cuneiform studies.

Cuneiform writing, as we said before, was used for monumental records only, a cursive writing—from right to left—being used for records of minor importance. The inscriptions are mostly found in three parallel columns or tablets, and are then translations of each other in different alphabets and languages, called respectively Persian, Median, and Assyrian; the Achæmenian Kings being obliged to make their decrees intelligible to the three principal nations under their sway, as in our days the Shah of Persia would use the Persian, Turkish, and Arabic languages, in order that he might be understood in Bagdad and Teheran.

The first of the three, the Persian—first, in so far as it always holds the place of honour—consists of 39 to 44 letters, and is the most recent of the three, the most ancient being the Assyrian. It is distinguished by the oblique stroke which divides its words. Its letters are composed of not more than five strokes or wedges placed side by side horizontally or perpendicularly, or both, never—with one exception—crossing each other. The language is pronounced by all investigators (save Gobineau), to be as near Sanscrit as possible, although not so refined, and to be the mother-language of modern Persian. It is only twice found by itself; all the other inscriptions are trilingual. The time of its use is confined to the years 570—370 B.C. The oldest instance of its employment is an inscription of Cyrus the Great at Pasargadæ; the most recent, that of Artaxerxes Ochus at Persepolis. The most important is that of Darius Hystaspis, in the great inscription of Behistun, which contains, besides genealogical records, a description of the extent of his power, the leading incidents of his reign, prayers to Ormuzd and the angels, and reference to the building of the palaces—the last two subjects generally forming the only contents of the other Persian inscriptions. The inscription of Artaxerxes Ochus is important, in so far as it traces his origin to the Achæmenidæ, through Arsames, grandfather of Darius. Most of these inscriptions occur at Persepolis, Behistun, Naksh-i-Rustam, and Hamadan.

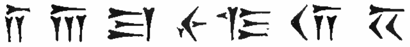
The second kind is called the Median, because it takes the second place in the trilingual inscriptions, under the conquering Persians, but over the conquered Assyrians, and as the Medes stood somewhat in that relation to these two nations, that name was selected. Another name, 'Scythic,' has been proposed, or, by way of compromise, 'Medo-Scythic,' and the language—supposed to have been spoken by those innumerable Tartaro-Finnic tribes which occupied the centre of Asia—has been pronounced to be a Turanian dialect. But the process of constructing out of such slender elements as Samojed and Ostiak words, a so-called 'Scythic,' is somewhat similar to the attempt of reconstructing Sanscrit from some detached and very doubtful French and English words. These inscriptions never occur by themselves (one instance again excepted), and being translations of the Persian records, about ninety names have been ascertained, and an alphabet of about 100 characters—combinations of a syllabic nature—has been established. The principal investigators of this character are Westergaard, De Saulcy, Hincks, Norris, and Oppert. Gobineau holds the language to be Huzvaresh, a mixture of Iranian and Semitic.

The third and most important is the Assyrian portion of the cuneiforms. The trilingual records gave the first clue to the deciphering of this character; but many original, more than a thousand years older, documents have since been found in Babylon, Nineveh, and other places near the Euphrates and Tigris, and even in Egypt. About 400 different signs have been distinguished on slabs, cylinders, barrels, prisms, of a phonetic, syllabic, and ideographic nature. Proper names are preceded by monograms, which give the same help to their readings as cartouches in hieroglyphics. Of those 400 signs, however, hardly one-tenth are known for certain. Proper names were found varied to about five times, and the characters themselves are both homophonous (same sound expressed by various signs) and polyphonous (same sign with various sounds). Five and more dialects have been distinguished in the language, which is decidedly Semitic (Gobineau takes it to be simply Arabic); and these dialects are supposed to have belonged either to different tribes or subsequent periods. It is this alphabet about which the greatest uncertainty and confusion prevail, for endless subdivisions, and even certain assumed grammatical forms, do not constitute a certainty. There is, however, a hope of its eventually being fully deciphered. A few years ago, the Asiatic Society submitted a cylinder of Tiglath-Pileser to four prominent investigators of the subject, and they independently read it nearly alike, with exception of the proper names, where they widely differed. As a proof of the enormous importance of this character for history, grammar, law, mythology, archæology, and antiquities generally, we will name some of the records of which Rawlinson, a few years ago, proposed the publication (now in progress): Chaldæan Legends (2000—1500 B.C.); Bricks from Kilehsergat, of the early Kings of Assur (1273—1100), in a character approaching the cursive; Annals of Tiglath-Pileser I. (1120 B.C.); Annals of Sardanapalus, of Shamas, father to the biblical Pul, of the biblical Pul and Semiramis, his wife, of Sargon, Sennacherib, Assur-bani-Pal, son of Esarhaddon; Cylinder of Nebuchadnezzar; Cylinders containing the notice of Belshazzar, &c.; besides syllabaries, vocabularies, mathematical and astronomical tablets, calendars and registers, and more than 1000 mythological tablets. Nay, if the Birs-Nimrud really stands on the foundations of the old tower of Babel, we might in the bricks excavated at these very foundations read the language spoken at the time 'when the whole earth was of one speech.'

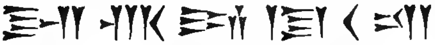
As to the origin of the character, we will briefly state, in conclusion, that nothing certain is known, or is likely to be known for some time. It is not unlikely, however, that it was hieroglyphic, although neither the fishes nor the bees, which these letters are supposed to have been originally, seem to have more in their favour than the worms, which were said to be their unconscious authors. The following is the opinion of Rawlinson on this point: 'That the employment of the cuneiform character originated in Assyria, while the system of writing to which it was adapted was borrowed from Egypt, will hardly admit of question. Whether the cuneiform letters, in their primitive shapes, were intended like the hieroglyphs to represent actual objects, and were afterwards degraded to their present forms; or whether the point of departure was from the Hieratic, or perhaps the Demotic character, the first change from a picture to a sign having thus taken place before Assyria formed her alphabet, I will not undertake to decide; but the whole structure of the Assyrian graphic system evidently betrays an Egyptian origin. The alphabet is partly ideographic and partly phonetic, and the phonetic signs are in some cases syllabic, and in others literal. Where a sign represents a syllable, I conjecture that the syllable in question may have been the specific name of the object which the sign was supposed to depict; whilst in cases where a single alphabetical power appertains to the sign, it would seem as if that power had been the dominant sound in the name of the object.'

In order to give the reader some idea of the appearance of the cuneiform character, we subjoin the name of Darius (Dariyavas, Tariyavaus), written in the Persian, Scythic, and Assyrian alphabets:

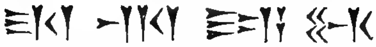
Persian.



Scythic.



Assyrian.



For fuller information on this subject, see Rawlinson, *The Persian Cuneiform Inscription at Behistun decyphered and translated*, &c. (Journal As. Soc., 1846, &c.); Grotefend, *Erläuterungen der Keilinschriften aus Behistun* (Göttingen, 1854); Lassen u. Westergaard, *Uber die Keilinschriften der ersten und zweiten Gattung* (Bonn, 1845); Hincks, *On the First and Second Kinds of Persepolitan Writing* (Transact. Roy. Ir. Soc., 1846); Norris, *Memoir on the Scythic Version of the Behistun Inscription* (Journ. As. Soc., 1853); Rawlinson, *A Commentary on the Cuneiform Inscriptions of Babylon and Assyria* (Lond. 1850); Oppert, *Etudes Assyriennes* (Journal Asiatique, Paris, 1857); Rénan, *Critique*, &c. (Journ. d. Sav., Paris, 1859).

**CU'NNINGHAM**, Allan, poet and *littérateur*, was born in 1785, at Blackwood, in Dumfriesshire. The circumstances of his parents were humble. At the age of 11, C. was taken from school, and apprenticed to a stone-mason. He worked faithfully at his calling; but his spare time, and his evenings, were given to song and the collection of traditions. He first appeared in print as a contributor to Cromek's *Remains of Nithsdale and Galloway Song*. These contributions, purporting to be ancient ballads, were entirely the composition of the ingenious and ambitious stone-cutter. The publication gained him the acquaintance of Hogg and Sir Walter Scott. With the latter, 'Honest Allan' was always a prodigious favourite. On his removal to London, he became one of the best known writers for the *London Magazine*. He subsequently obtained a situation in Chantrey's studio as foreman, or confidential manager, and this office he held till his death. During his career, he wielded an indefatigable pen. He wrote novels, poems, and a drama. His principal prose works, apart from his fictitious narratives, are *Lives of the Painters*, a *Life of Burns*, and a *Life of Sir David Wilkie*. His death took place in London on the 29th of October 1842. As a Scotch poet, he ranks, perhaps, after James Hogg. His songs, although disfigured by false taste, mannerism, and a superabundance of ornament, have true lyrical impulse and movement.

**CUNNINGHAM**, Peter, a *littérateur* of some note, son of Allan Cunningham the poet (q. v.), was born at Pimlico in 1816. Since 1834, he has held a government situation. His chief writings are the *Handbook of London*, the *Life of Drummond of Hawthornden*, the *Handbook to Westminster Abbey*, the *Life of Inigo Jones*, *Modern London*, &c. He has, besides, edited Johnson's *Lives of the Poets*, and the works of Oliver Goldsmith, the Songs of England and Scotland, and the Letters of Horace Walpole. C. has also contributed extensively to *Fraser's Magazine*, the *Athenæum*, *Household Words*, &c.

**CUNNINGHA'MIA**, a genus of trees of the natural order *Coniferæ*, nearly allied in botanical characters to the true pines and firs, but in foliage having considerable resemblance to the Araucarias. *C. Sinenois* is an evergreen tree, with narrow ovato-lanceolate, stiff, and sharp-pointed leaves, common in many parts of China, but too tender for the climate of Britain.

**CUP**, Divination by, a mode of foretelling events, practised by the ancient Egyptians, and still prevailing in some of the rural districts of England and Scotland. One of the eastern methods consisted in throwing in small pieces of gold or silver leaf into a C. of water, in which also were placed precious stones, with certain characters engraved upon them. The infernal powers were then invoked, and returned answer, either in an intelligible voice, by signs on the surface of the water, or by a representation in the C. of the person inquired about. By the modern method, a person's fortune is foretold by the disposition of the sediment in his tea-cup after pouring out the last of the liquid. Few people now, however, even among the most ignorant of those who practise and are practised upon by C. divination, have implicit faith in the utterance of the oracle.

**CU'PAR-A'NGUS**, a town on the borders of Perthshire and Forfarshire, and partly in both, is situated on the left bank of the Isla, a tributary of the Tay, 12½ miles east by north from Perth, and 16 miles west-north-west from Dundee. It lies between the Grampian and Sidlaw Hills, in the centre of the Valley of Strathmore, and from its position in this valley it is popularly called 'the capital o' the How.' Pop. in 1861, 2024. It has extensive linen manufactures, with a considerable traffic in timber. Near the town are the remains of two Roman camps, on one of which stand the ruins of a monastery, built in 1164 by Malcolm IV., and destroyed at the Reformation. Recent excavations have exhumed numerous richly carved tombstones in the grave-yard contiguous to the parish church, evidently those that had marked the graves of the ancient dignitaries of the monastery, and which had been covered up by the ruins of the decaying edifice. The abbey revenue in 1562 was £1238, 14*s*. 9*d*. in money, and 182 chalders of victual. The classic hill of Dunsinane is situated about five miles to the south-west of C., and the dilapidated castle of the 'bold Pitcur,' who fell in the battle of Killiecrankie, in 1689, is within a distance of two miles.

**CUPAR-FIFE**, a royal, parliamentary, and municipal burgh, and the county town of Fifeshire, near the middle of the peninsula of Fife, on the Eden, 9 miles from its mouth, 32¼ miles north of Edinburgh, and 14½ south of Dundee. It lies in a beautiful vale, stretching east and west, with a range of hills on the south, and a fertile country, with wooded eminences, on the north. It consists chiefly of two streets at right angles to each other. Pop. of town, 4005. The chief manufactures are coarse linens, bricks, and earthenware. It contributes, with St Andrews, East and West Anstruther, Crail, Kilrenny, and Pittenweem, to return one member to parliament. A fortress of the Macduffs, thanes of Fife, once stood on a mound called the Castle Hill, at the east end of the town. In former times, religious shows, mysteries, or moralities, were acted on a green esplanade in front of the castle, still called the Play-field. There also was acted the *Three Estates*, a celebrated satire on the priesthood, which hastened the religious revolution, and was written by Sir David Lindsay, whose estate of the Mount was near the town.

**CU'PEL.** See Cupellation.

**CUPELLA'TION** is the process of the separation of one metal from another (as lead from silver) by the use of a Cupel highly heated in a muffle furnace. See Assay.

**CU'PID**, one of the gods of the classic mythology, whose name in Latin signifies *Desire*. The genealogy of this meddlesome divinity is rather confused. Sometimes he is represented as the son of Vulcan and Venus, or of Mars and Venus, while at other times the mythologists seem at a loss to name his father, and make him spring from the sea-foam, like Venus herself. As among the Greeks, the myth of Eros gave birth to numerous *Erotes* or Loves, so at Rome, also, that of C. originated a legion of Cupids, who all possessed the same attributes as their prototype. Every one knows what these were: the bow, arrows, quiver, and wings. Often a bandage covered the eyes. The appearance was that of a chubby child, or youth with a malicious smile. His darts could pierce the fish at the bottom of the sea, the birds in the air, and the gods in Olympus. The immensity of space was his home, but like his mother, he specially loved the flowery thickets of Cyprus.

**CU'POLA** (Ital., from the root of *cup*), a spherical vault, or concave ceiling, on the top of a building. Cupolas are hemispherical, or of any other curve, and often consist of glass, so as to form a window in the roof. See Dome.

**CUPPING** is the application of cups, from which the air has been exhausted, to the skin, with the object of causing congestion or excessive fulness of the cutaneous blood-vessels; and if it should be thought desirable to withdraw some blood, the skin may be cut or scarified, and the exhausted cups applied over the incisions, to favour its flow.

C. has been a part of surgical practice from the earliest times, and instruments for performing it have been found in use among the least civilised nations. Of old, the cups were either small horns, open at both ends, from which the air was withdrawn by suction at the narrow extremity, or glasses of various shapes, with a small hole in the bottom of each. This hole was plugged with wax, the air exhausted by heat, and when the operator wished to remove them, he withdrew the plug, and allowed the air to enter. The modern cups are of glass, with round or oval mouths, and closed bottoms. Some have small sockets for holding cotton wick in their interior.

The principal improvements have been in the methods of incising the skin. This used to be effected with a common lancet or narrow knife, with a short blade and convex edge, set in a long elastic handle, which the operator struck rapidly with his finger, so as to drive the blade 26 or 30 times into the skin.

This was so tedious an operation, that a number of similar blades were used at once. These are contained in a box, which has slits pierced in it corresponding to the number of blades; the latter can be caused to emerge at these slits by turning a handle, or more rapidly by setting free a spring, which causes them to revolve suddenly, and in doing so protrude at the slits more or less, according to the will of the operator. The operation is thus performed: The scarificator, glasses, torch, spirits of wine, and a lighted candle are placed ready at hand; the part is sponged with hot water, so as to cause an increased flow of blood into it, then dried with a warm towel; the torch, previously saturated with the spirits of wine and lighted, is held for an instant in one of the glasses, which is now clapped on to the skin. The number of glasses depends on the quantity of blood it is thought desirable to abstract; each one will probably withdraw from three to five ounces. When the skin under the glass has become red and swollen, the cupper removes it, applies the scarificator, and as rapidly as possible again exhausts the air from the glass, and claps it on again. The blood will now flow into it; and when enough has been taken, the glass is removed, and some lint applied to the wounds. This apparently simple proceeding requires considerable skill, so that C. is practised as a separate profession in large towns, and the medical boards of the public services require that candidates for their appointments should produce a certificate of having received special instruction in the art. The difficulties consist in regulating the depth of the cuts, for should they be either too deep or too shallow, the blood will not flow. If the glasses be completely exhausted of air, their rims hurt the patient, and the blood will not flow, and it has happened that arteries or large veins have been wounded by ignorant operators.

There are many modifications of the ordinary C. apparatus, but all on the same principle.

*Dry C.* is simply applying the cups as described, but not wounding the skin. The ancients had a high opinion of this method, as they believed the 'noxious humours' were drawn forth of the body into the cups; and it need scarcely be added that extempore cups may be found in tumblers, finger-glasses, or any air-tight vessel with a smooth rim.

**CU'PULE** (*Cupula*), in Botany, a sort of cup formed by a number of cohering bracts, and surrounding the fruit or the base of the fruit in certain plants; as the oak, in which it is the cup of the acorn, and the hazel, in which it is the husk of the nut.

**CUPULI'FERÆ** (i. e., cupule-bearing), or CORYLACEÆ, a natural order of exogenous plants, consisting of trees and shrubs, natives of temperate climates. The leaves are alternate and furnished with stipules. The male flowers, and sometimes also the female flowers, are disposed in catkins (and this order is regarded by many botanists as a sub-order of Amentaceæ, q. v.); the stamens are 5—20, inserted into the base of scales or of a membranous perianth; the ovary is crowned by the rudiments of a persistent perianth, and surrounded by a Cupule (q. v.) of various figure; there are several cells and ovules, but the greater part of the ovules are abortive; the fruit is a 1-celled nut, more or less enclosed in the cupule; the seed is usually solitary; the embryo large, with fleshy cotyledons and minute superior radicle.—This order contains many of the most important trees of Europe and America, including all the different kinds of Oak, Beech, Chestnut, and Hazel, the Hornbeam, &c. Many species are also natives of tropical countries, but they are there only found at considerable elevations.

**CUR** (Welsh *cor*, a dwarf, anything small; *cor-avon*, a small river; *corgi*, a small dog), a name sometimes applied indiscriminately to small dogs of any kind not highly valued, and in this way often particularly appropriated to dogs of mongrel breed, but also used by naturalists as the common designation of many races, of which the Terriers (q. v.) may be considered as the type; all of them of small size, and exhibiting in a high degree the capacity for domestication, along with activity and sagacity. These races are distributed over all parts of the world, and differ very considerably from each other, and are found domesticated even among very rude and savage tribes. The Pariah dog of India is reckoned among them, and exists in that country both in a wild and in a domesticated state; its body is more lank than that of the cur races of Europe, a character which is also in some measure exhibited by the dogs that haunt the streets of towns in Turkey, Persia, &c. The curs may, not improbably, have been the first domesticated dogs.

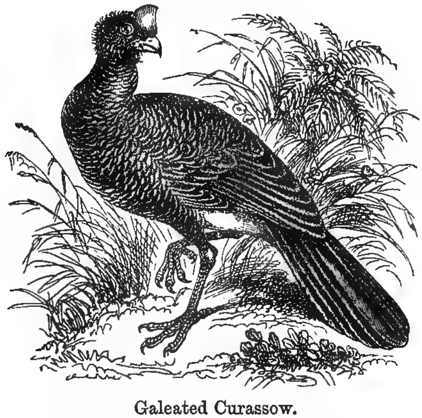
**CURAÇA'O, ISLANDS OF**, are Dutch possessions in the West Indies, situated near the northern shore of Venezuela, in the Caribbean Sea. They consist of Curaçao, Bonaire, Aruba, and Little Curaçao. Entire pop. in 1859, 31,741, of which about 10,000 are slaves. Chief town, Willemstad, on the island of Curaçao, one of the handsomest towns in the West Indies. Pop. about 8000. These islands depend upon rain for water. The coasts, on the whole, are difficult of access, the principal bay being that of St Anna, on which Willemstad stands. The soil in many places is arid and unproductive. Among the exports of C., may be noticed maize, beans, and other kinds of pulse, cattle, salt, and mortar. C. chiefly owes its prosperity to its commerce with the neighbouring islands and coasts. In 1827, it became a free harbour. The island was discovered by Spain in 1527, taken from that country by the Dutch in 1634, conquered by the English in 1807, and restored to Holland in 1815.

**CURAÇO'A** is a well-known and esteemed liqueur, made either from the small oranges called C. oranges, or from orange-peel, by digesting in sweetened spirits, along with a little cinnamon, and often a little mace or cloves. The spirits used are generally reduced to about 56 under proof, and contain about 3½ pounds of sugar per gallon. C. is often coloured by digesting in it for a week or ten days a little powdered Brazil wood, and mellowing the colour by means of burned sugar.

**CURAÇOA ORANGES**, small oranges which have fallen from the tree long before maturity. They have properties similar to those of orange-peel, but are more bitter and acrid, and are used for the same purposes.

**CURARI, OURARI, WOORALI, or WOORARA**, a celebrated poison used by some tribes of South American Indians for poisoning their arrows. It is by means of this poison that the small arrows shot from the Blowpipe (q. v.) become so deadly. The nature and source of this poison remained long unknown, the Indians being very unwilling to reveal the secret, which seems, however, to have been at last obtained from them by Sir Robert Schomburgk, and it is now regarded as pretty certain that the principal ingredient is the juice of the *Strychnos toxifera*, a tree or shrub of the same genus with that which yields nux vomica. See STRYCHNOS. It has a climbing stem, thickly covered with long spreading reddish hairs; rough, ovate, pointed leaves, and large, round fruit. The poison, when introduced into the blood, acts on the nervous system, and produces paralysis, with convulsive movements, and death ensues. It is supposed to be the most powerful sedative in nature. Artificial respiration is the most efficacious means of preventing its effects. It has been proposed to employ it in the cure of lockjaw and hydrophobia, and it has recently been asserted, as the result of experiment, that it can be very beneficially employed in the former disease. Like snake-poison, it is comparatively inert when taken into the stomach.

**CURA'SSOW, or HO'CCO** (*Crax*), a genus of large gallinaceous birds of the family *Cracidæ*, having a strong bill surrounded at the base with a skin—sometimes brightly coloured—in which the nostrils are pierced, and the head adorned with a crest of feathers curled forward, which can be raised and depressed at pleasure. The species, which are not numerous, are natives of the forests of the warm parts of America. They congregate in flocks, and although they live much among the branches of trees, their habits greatly resemble those of domestic poultry. They are very unsuspicious of danger, until taught by severe experience; and are easily domesticated. The best known species (*C. Alector*) is about the size of a turkey, its plumage is almost entirely black. It is abundant in the forests of Guiana. Its flesh is very good eating. It is kept in poultry-yards in South America, and was introduced into Holland at the close of last century, where it seemed completely acclimated, but the stock was lost amidst the troubles which ensued on the French Revolution.


Galeated Curassow.

**CU'RATE**, literally, one who has the cure (Lat. *cura*, care) of souls, in which sense it is used in the Church of England Prayer-book, 'all bishops and curates.' It is, however, generally used to denote the humblest degree in the Church of England. A C., in this sense, is a minister employed by the incumbent of a church (rector or vicar), either as assistant to him in the same church, or else in a chapel of ease within the parish belonging to the mother church. He must be licensed and admitted by the bishop of the diocese, or by an ordinary having episcopal jurisdiction, who also usually appoints his salary. Any C. that has no fixed estate in his curacy, not being instituted and inducted, may be removed at pleasure by the bishop or incumbent. But there are *perpetual* curates as well as temporary, who are appointed where tithes are impropriate and no vicarage was ever endowed: these are not removable, and the impropriators are obliged to maintain them. In general, the salaries of curates, certainly the hardest-worked, and not the least devoted of the English clergy, are shamefully small, and reform in this matter is urgently required.

**CURA'TOR TO A MINOR.** See GUARDIAN.

**CURB** (in horses) consists of strain of the straight ligament which runs down the back of the hock; is most common in animals with straight small hocks and that conformation known as *sickle hams;* whilst like other strains it occurs from sudden and violent exertion, often proceeding in the lighter breeds from leaping or galloping in heavy ground, and in the heavier, from the effort of keeping back a load whilst going down a steep incline. Swelling appears on the inner and back part of the joint, generally causing lameness, which is most apparent in trotting, and, in slight cases, usually wears off after the animal has been out for ten minutes. Fomentations must first be used to allay the irritation and inflammation; when heat and tenderness disappear, cold applications will be advisable; when, after ten days, the enlargement still continues, a blister may be necessary; whilst, from the first, all work must be forbidden.

**CURCAS.** See PHYSIC NUT.

**CURCU'LIO.** See WEEVIL.

**CURCU'MA** (Arab. *kurkum*), a genus of plants of the natural order *Scitamineæ*, having the tube of the corolla gradually enlarged upwards, and the limb two-lipped, each lip three-parted. The species are stemless plants, with palmate tuberous roots, natives of the East Indies. The dried roots of some are the Zedoary (q. v.) of the shops; the roots of others yield Turmeric (q. v.); and some yield a kind of Arrow-root (q. v.). The same species often yields both arrow-root and turmeric, the former being obtained from the young roots, the latter from the old.—*C. Amada* is called MANGO GINGER. Its root when fresh has the smell of a mango, and in its qualities resembles ginger. It is a native of Bengal.

**CU'RFEW** (Fr. *couvre-feu*, cover fire). To William the Conqueror is ascribed the introduction of the C. bell into England, the object of which was to warn the people to cover up their fires, and retire to rest. The time for ringing these bells was sunset in summer, and about eight o'clock in winter; and certain penalties were imposed upon those who did not attend to the signal. The practice of ringing the C. bell, however, appears to have prevailed throughout Europe long before the era of the Norman Conquest, its object being the laudable one of preventing fires, which, owing to houses being chiefly composed of wood, were then both frequent and destructive. The custom of ringing the C. bell at eight or nine o'clock, is still continued in many parts of England, though its original significance is of course lost.

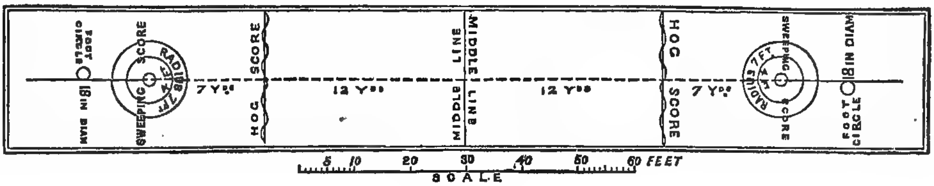
**CU'RIA MU'RIA ISLANDS.** See KOORIA MOORIA ISLANDS.

**CU'RISCHES HAFF.** See KURISCHES HAFF.

**CU'RLEW** (*Numenius*), a genus of birds of the order *Grallatores*, and of the same family (*Scolopacidæ*) with the snipe, woodcock, avocet, stilt, godwit, &c. The bill is long, slender, curved, and compressed; the face and head are feathered; the legs are slender, and part of the *tibia* is naked as well as the shank; the tail is short, and the folded wings extend about as far as the tail. The Common C. (*N. arquata*), the *Whaup* of the Scotch, is a bird of wide geographic distribution, being found in tropical, temperate, and arctic regions of the Old World and in Australia. It is common in Britain, frequenting the sea-shores in winter, and elevated moors in summer. Its peculiar cry or whistle is among the well-known characteristics of many upland scenes. It feeds on worms, molluscs, and insects. Its long bill enables it to seek its food in marshy or boggy ground. It builds a slight nest of leaves or other dry materials, in some tuft of rushes or among long grass or heath, in which four eggs are laid. The C. is good eating.—The WHIMBREL (*N. phæopus*) is a smaller species of C., much resembling the Common Curlew. It is also very widely distributed in the Old World; it frequently occurs on the shores of Britain, but seems to breed only in the most northerly moors. North America has several species of C., some of which extend their summer migrations to very northerly regions. The ESQUIMAUX C. (*N. borealis*) is sometimes seen migrating in dense flocks.

Common Curlew (*Numenius arquata*).

**CURLING**, a sport on the ice common in Scotland, where it is played by all classes of people in winter. Frozen-over lakes and rivers answer for the purpose, but under the auspices of C. clubs, artificial shallow ponds are maintained for the sake of this popular national sport, and these *bonspiels*, or set matches, are contested with immense spirit. The sport is regulated by a body of rules issued by a central association called the Caledonian Curling Club, which has grand matches in which hundreds are engaged at least once, if possible, every winter. The remarkable and pleasing peculiarity of C. is, that it produces for the time a thorough mingling of ranks—peers, peasants, clergymen, farmers, country gentlemen, and tradesmen, all mingling hilariously and familiarly for the occasion. The sport belongs more particularly to the south-western division of Scotland. Latterly, it has migrated to England, Canada, and other countries where Scotsmen can find ice of sufficient strength and keenness. C. is played with flattish round stones, about nine inches in diameter, prepared by stone-hewers, each stone weighing from 30 to 45 lbs. Each of the players has a pair. The stones are provided with handles, to enable the player to hurl them on the ice with the proper degree of force. As at bowls, the stones are hurled to an assigned point or mark. The game is as follows: Sides are made up, usually consisting of four against four, with a director styled *skip* for each; after which a certain length of ice, of from 30 to 40 yards in length, and 8 or 9 feet across, is chosen. This is called the *rink*. Certain marks are then made at each end of the rink, consisting of several concentric rings, called *broughs*, and a centre, called the *tee*. A certain number is game, usually 31, and the keenness displayed by rival sides in competing for victory, is perhaps without a parallel in any other pastime whatever. One on each side plays alternately. The chief object of the player is to hurl his stone along the ice, towards the tee, with proper strength and precision; and on the skill displayed by the players in placing their own stones in favourable positions, or in driving rival stones out of favourable positions, depends nearly all the interest of the game. At a certain distance from each of the tees, a score—the *hog-score*—is drawn across the ice; and any stone not driven beyond this mark, counts nothing, and is laid aside. In country places, a dinner composed of 'beef and greens,' the well-known curler's fare, generally concludes the day's diversion, which, taking place when out-door labour is suspended, is felt to be no encroachment on rural occupations. For laws and regulations of C., and general remarks on the game, see *Chambers's Information for the People*, article 'Out-of-Door Amusements,' No. 95.



The Rink.

CU'RRACH, COURACH, or CO'RACLE (Celt. *corwg*, *curach*; Lat. *curuca*, *carrocium*, *carabus*), the name given in the British islands to a canoe or boat, made of a slender frame of wood, covered with skins. Skiffs of this sort, as well as canoes hollowed out of the trunks of oaks, were in use among the Britons in the earliest times of which we have record. Julius Cæsar, who built some of them after the British model, tells us that the keel and gunwales were of light wood, and the sides of wicker, covered with hides. Similar descriptions of the C. are given by Pliny, Lucan, Solinus, Festus Avienus, Sidonius Apollinaris, and others. The first occurrence of the name seems to be in Gildas, who wrote in the 6th c.; he speaks of the C. as in use among the Scots and the Picts. A long voyage in the North Sea, made in a C., during the same century, by one of the companions of St Columba, is commemorated by Adamnan, who died in 704. In 878, three Irish missionaries sailed in a C. from Ireland to Cornwall; the voyage occupied seven days; and the size of the C. is indicated by the remark that it was one of two skins and a half. An old life of St Patrick speaks of a C. 'of one skin, with neither helm nor oar.' The C. of a larger size had a mast and sail. The C. still continues to be used on the Severn, and on many parts of the Irish coast, especially on the shores of Clare and Donegal. The last C. known to have been used in Scotland is in the museum at Elgin. It was employed on the Spey, towards the end of last century. Shaw, whose *History of Moray* was published in 1775, when the C. had become rare, thus describes it: 'It is in shape oval, near three feet broad, and four long; a small keel runs from the head to the stern; a few ribs are placed across the keel, and a ring of pliable wood around the lip of the machine. The whole is covered with the rough hide of an ox or a horse; the seat is in the middle; it carries but one person, or, if a second goes into it to be wafted over a river, he stands behind the rower, leaning on his shoulders. In floating timber, a rope is fixed to the float, and the rower holds it in one hand, and with the other manages the paddle. He keeps the float in deep water, and brings it to shore when he will. In returning home, he carries the machine on his shoulders, or on a horse.' One who figures in the *Dunciad*—Aaron Hill the poet—by shewing the Strathspey Highlanders how to make their timber into a navigable raft, hastened the disappearance of the C. from Scotland. A description of the C., as still used in Ireland, will be found in the *Ulster Journal of Archæology*, vol. i. p. 32. A boat of bison skin, essentially the same with the British coracle, is in use among some of the Indians of North America.

Modern Coracle.

CU'RRAN, John Philpot, a celebrated legal and parliamentary orator, born at Newmarket in the county of Cork, Ireland, July 24, 1750; was educated at Trinity College, Dublin; and in 1773, having resolved to adopt the law as a profession, went to London and entered himself at the Middle Temple. Two years after, he was called to the Irish bar, where his humorous, flowery, and sarcastic speech secured him immediate success, which his attractive social qualities did much to extend. In 1782, he obtained a seat in the Irish parliament as member for Kilbeggan, his general policy being in unison with that of Mr Grattan and the few other liberal members who were then in the House. In debate, C. was usually charged with the reply to opponents, for which important duty his ready speech and cutting retort admirably qualified him. But his sarcasm led him into several duels, in which fortunately little harm was done on either side. In 1788, he was in favour of the formation of Irish volunteers; and in subsequent years, he was constant and eloquent in his appeals to government to adopt a different policy towards Ireland, as that which it was pursuing was likely to drive the people to rebellion. Government gave no heed, and the rebellion of 1798 was the consequence. C. had retired from parliament before the Union, of which he was a warm opponent. He was appointed Master of the Rolls in Ireland in 1806, an office he held until 1813, when he resigned. He died in London, October 14, 1817. C. is best remembered for his wit and gaiety, of which many excellent examples are preserved in the various Memoirs, Recollections, &c., of him which have been published.

CURRANT, a name originally belonging to a small kind of grape (see Currants), and transferred, in consequence of the similar size of the fruit, to many species of the genus *Ribes*, the most important and almost the only genus of the natural order *Grossulariaceæ*. The species known as *currants* are destitute of spines, and have the flowers in racemes: the spiny species are known by the name Gooseberry (q. v.). Among the fruit shrubs most generally cultivated in our gardens is the Red C. (*R. rubrum*), *Grosseille* of the French, a native of woods and thickets in the south of Europe, found also in some parts of Asia and of North America, perhaps rather a naturalised than a truly native plant in Britain. It has long been cultivated, although it does not appear that it had a place in the gardens of the ancient Greeks or Romans. The berries, besides being used for dessert, and to a much greater extent for pies, and for making jelly, are used also for making an agreeable and refreshing beverage, called in France *Eau de Grosseilles* (made of the juice of the fruit, water and sugar, strained, and iced), and a well-known fermented liquor called *Currant Wine* (q. v.).—The White C. is a mere variety of the Red, the result of cultivation, with fruit less acid, and more fit for dessert, generally also rather larger. There are many sub-varieties, and many intermediate shades of colour. Both the Red and the White Currants are either trained as standard bushes, or against walls, the latter treatment producing larger and finer fruit, and both are sometimes trained on a north wall, to retard their ripening till after the ordinary season. They grow readily, like the shrubs of this genus in general, from cuttings.—The Black C. (*R. nigrum*), *Cassis* of the French, grows in moist woods, and on the banks of streams in Europe and the north of Asia. The fruit is much larger than the Red C., and cultivation has lately produced varieties remarkable for size. There is a variety found in Russia with yellow berries. The Black C. is not so much cultivated in Germany and Holland as the Red, and is comparatively neglected even in England, but is to be found in almost every garden in Scotland. The jelly and preserve made from it are very useful for sore throats, as is also *Black C. Vinegar*, made in the same manner as Raspberry Vinegar. In Russia, the berries are gathered in large quantities in the woods, and dried in ovens, to be used in pies. They are tonic, and also slightly diuretic and sudorific. A liqueur, called *Liqueur de Cassis*, is prepared in France from the Black C., the manufacture of which has recently acquired a great importance in the Côte d'Or and neighbouring departments. The town of Dijon contains more than thirty manufactories, and produced, in 1859, not less than 220,000 gallons of this liqueur, the wholesale price of which—of the best quality—is equal to 2*s*. 9*d*. per quart. Large tracts of land are planted with the Black C. to supply the liqueur manufactories. It has very reasonably been suggested that the experiment of the introduction of this manufacture should be made in Scotland, and even in the Hebrides and Shetland Islands, where the Black C. perhaps grows as luxuriantly, and bears fruit as abundantly as in any part of the world. —Many other species of C., producing berries somewhat similar to those of the species so extensively cultivated, and some of them probably deserving of attention and cultivation, are found in temperate and cold climates in almost all parts of the world. One with beautiful red berries, larger than the largest English Red C., occurs on the Himalaya at an elevation of 13,000 feet.—The Red-flowered C. (*R. sanguineum*), now so common as an ornamental bush in shrubberies, and trained on walls, producing in April a profusion of deep-red flowers in large drooping racemes, is a native of the north-west of America, and was introduced into Britain in 1826. Its bluish-black, mucilaginous, insipid berries are not, as is popularly believed, poisonous.—The Golden C. (*R. aureum*), also a very ornamental shrub, from the same regions, has a tubular calyx and long golden yellow flowers. Its fruit, which is either yellow or black, and of fine flavour, is not freely produced in Britain.—The name Native C., or Australian C., is given in Australia to the berries of different shrubs, particularly the white berries of *Leucopogon Richei*, of the natural order *Epacridaceæ* (q. v.). The French naturalist Riche, who was attached to D'Entrecasteaux's expedition, mainly supported himself on these berries for three days, when he had been lost by his companions. Other fruits bearing the same name are produced by species of *Coprosma* (nat. ord. *Cinchonaceæ*), but they are very inferior.

**CURRANT WINE** is made of the juice of red or white currants, to which is added about one pint of water for every four pints of berries employed. About a pound and a half of sugar is afterwards added to each pint of the liquor, a little spirits being generally also added, before it is set aside to ferment. A larger quantity of sugar is sometimes employed, and no water, and a stronger and sweeter C. W. is thus produced. Fermentation requires several weeks, and the wine is not fit for use for at least some months afterwards. Black C. W. is made in the same way from black currants, but the fruit is put on the fire in as small a quantity of water as possible, and heated to the boiling-point before it is bruised. C. W., well made, may fairly challenge comparison with many products of the grape.

**CURRANTS**, a small kind of raisin (*Passulæ minores*), are the dried red or blue berries of a small-fruited seedless variety of the common vine, which is cultivated in the East, and especially in Greece. The name is derived from the city of Corinth, in the neighbourhood of which they were first cultivated. They are very small, round, with a thin skin, without seeds, and very sweet. Those brought from the island of Zante are most esteemed. They are much used by bakers and cooks, entering into the composition of many kinds of cakes, puddings, &c. They are a principal article of export from Greece, and the failure of the crop is severely felt in that country; whilst an increase of the price of C. is regarded as a disagreeable occurrence by the housewives of Britain. C. are simply dried in the sun, on the ground, and then packed into barrels. In a few districts of Greece, a very sweet oily wine, called currant wine, is made from currants.

**CU'RRENCY** means originally the capacity of being current, or, as Johnson defines it, 'the power of passing from hand to hand.' It is applied in practice to the thing that is so current, and generally to whatever, by being current among any nation or class of persons, serves as the money with which they buy commodities or pay their debts. It is necessary to be content with a practical explanation, without venturing on a scientific definition of the term, because, among the many disputed points in political economy, there is none productive of more exciting controversy than the proper regulation of the C.; and as the advocate of each theory is apt to define the term in the manner best suited to serve his own ultimate conclusions, his adversaries generally deny that his definition is sound. Whether correctly or not, it is applied in practice to everything that is received for payment. It differs from the word money, in its general acceptation, in as far as it expresses only that which passes as money at some time or place referred to. The leading question among political economists regarding C. is, how far it should be restrained. The most effectual method of restraining it is by confining it to the precious metals. If it were law that none but a gold C. should be used in any country, and if, at the same time, there were no effort to tamper with this gold C., and give it an artificial value, the C. of that country would keep its value all the world over, because it has been paid for in commodities, and will be sold again whenever it is in excess of the needs of those who use it. But for this very reason, it is a very expensive C., and therefore, ever since man's ingenuity was turned to trade, methods have been devised for superseding gold or the other precious metals by something cheaper. Unless, however, law or custom intervenes to give it efficiency, this cheaper material will only be worth its own intrinsic value. A five-pound Bank of England note is worth so little in its intrinsic value as a picture upon thin paper, that such a value can hardly be expressed. It derives its power as C. from the obligation it fixes on a great rich corporation to make good its professed amount to the holder. We thus pass from a purely bullion C. to the next step of restraint, which is generally called a mixed currency. Here some maintain that no note should be issued unless the banker or other person issuing it has in his possession as much bullion as will pay it. Others say it is sufficient that he is bound to pay its amount in bullion on demand without his actually possessing the bullion throughout the whole period of the C. of the note. A third party, again, are for a C. entirely free of a metallic basis; they hold that naturally paper-money, passing from hand to hand, will represent transactions, and will therefore come in the end to be made good in some shape or other; and they further hold, that if some losses should thus occur, these will be more than compensated by the rapid increase of trade and enterprise, caused by a free trade in C., as it is termed—that is to say, by every man issuing his own notes or promises to pay to whoever will take them. This last and extreme class of 'currency doctors,' as they have been termed, have lately been losing influence, and disappearing from the contest. Through a succession of practical measures, reached with considerable caution, the English have come to a mixed C., resting on a compromise between the two classes of mixed C. above referred to. In the theory of the measures brought to completion under Sir Robert Peel in 1844, it is admitted that, to a certain extent, a C. can be based on transactions and the property of those concerned in them, but that a limit must be drawn, to prevent the power of creating such a C. from running to excess, by the issue of notes which cannot be immediately made good by those who issue them. Accordingly, the several banks in existence were allowed to continue their note circulation, but they were permitted to increase it only on the condition of having bullion in their coffers to pay the additional notes issued by them. A C. which is not bullion, and is not worth its nominal value in bullion, is called a 'depreciated currency.' Before the resumption of cash payments, the notes of the Bank of England had sunk to be worth but 16*s.* in the pound, as compared with gold. A depreciated C. may be created by a government calling notes or any other form of money a legal standard, and issuing a greater quantity of them than the real transactions of the country and the property passing from hand to hand require; or it may be created by private persons acting under laws by which the right of issuing a C. is not duly limited. This faculty which a C. has of being depreciated without being repudiated, is the real source of danger in all proposals for an unfettered C., or a free trade in the issue of money. If the bank-notes for which bullion cannot be immediately obtained were repudiated, there might be a natural check on over-issues; but it is their nature, on account of the difficulty of getting bullion for them, or the chance that it may never be got, that they pass at a discount or reduction of their value. Hence such a C. would be ever shifting; there would be no permanent standard, and the person incurring a debt before a depreciation which he pays afterwards would, in reality, be paying his creditor a dividend only. A depreciated C., however, is useful for small transactions. In the silver C. of this country, a pound is worth little more than four-fifths of a sovereign. If a person due £100 could pay it in silver, he would get off with a dividend of from 16*s.* to 18*s.* in the pound; but by law, silver is not a legal tender for more than 40*s.* The copper C. is so far below its real value, that it has not been thought worth while to give it a permanent weight—pence and halfpence have just been issued little more than half the weight of those of former mintages; but they are only used as a medium for small sums, and the royal stamp is sufficient to establish a reliance on them.

**CU'RRENTS.** See GULF STREAM, TIDES.

**CU'RRIE, DR JAMES,** best known for his valuable edition of Burns's works, long the basis of all subsequent editions, was born in Dumfriesshire, May 31, 1756. He was at first educated for a mercantile life, but afterwards studied medicine at Edinburgh University; and settling in Liverpool in 1781, soon obtained a good practice. He contributed some excellent papers to medical journals, but his chief work in connection with his profession was, *Medical Reports on the Effects of Water, Cold and Warm, as a Remedy in Febrile Disease,* the recommendations in which work have been followed with much success. The edition of Burns (introduced by a criticism on his writings), which he undertook solely for the benefit of the widow and children of the poet, was published in 1800, and realised £1400. C. died August 31, 1805.

**CU'RRY-COMB.** A kind of scraper used for dressing horses. It consists of a number of iron plates notched on one edge to form rough teeth. These plates are fastened in parallel lines to an iron back, to which a handle is attached, and the horse is 'curried' by scrubbing with the teeth.

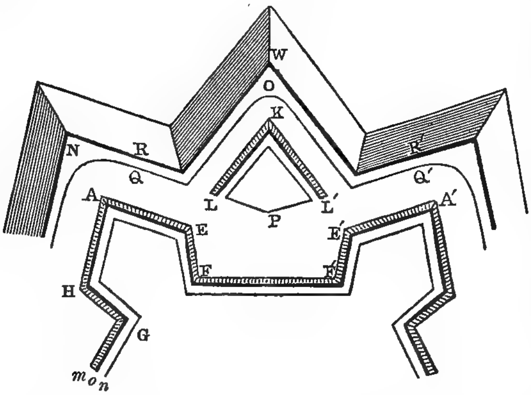
**CURRYING.** See LEATHER.

**CURRY POWDER,** or **CURRY PASTE,** is a compound of turmeric and various spices; it is used to a large extent in India and elsewhere as a seasoning for a variety of dishes. One of the best receipts for the compounding of C. P. is, turmeric powder, 6 oz.; coriander seed powder, 8 oz.; black pepper, 4 oz.; fenugreek, 2 oz.; ginger, 2 oz.; cayenne pepper, ½ oz.; cummin seed, ½ oz. Another process is to mix turmeric powder, 5 oz.; coriander seed powder, 3 oz.; black pepper, 1 oz.; ginger, 1 oz.; cayenne pepper, 1 oz.; scorched mustard, 2 oz.; mace, 2 drachms. And a third variety is obtained from turmeric powder, 8 oz.; coriander seed powder, 4 oz.; black pepper, 1 oz.; cayenne pepper, 1 oz.; scorched mustard, ½ oz.; mace, 1 drachm; cinnamon, 1 drachm; cardamoms, 2 drachms.

**CURSE OF SCOTLAND,** a term applied to the *nine of diamonds* in a pack of playing cards. Much uncertainty prevails respecting the origin of this phrase. The most probable explanation is, that it refers to the detestation entertained in Scotland towards John Dalrymple, first Earl of Stair, on account of his concern in the Massacre of Glencoe, and for which he had to resign office, 1695. The heraldic bearing of this personage was 'or, on a saltire azure, nine lozenges of the field.' These nine lozenges resemble the nine of diamonds, and hence the popular phrase, the curse of Scotland.

**CURSING.** See INCANTATION, SWEARING.

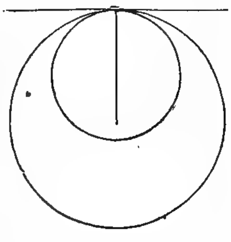
**CU'RTAIN**, in Fortification, is the portion of rampart or wall between two bastions or two gates. In a regular siege, to batter down the C. is one of the main operations depended on; and many of the external works constructed by the defenders are intended to frustrate, or at least embarrass, this operation. In the annexed cut, which shews a ground-plan of some of the elements of a regular fortification, FF' is the *curtain;* HAEF, a *bastion.* The component parts of the bastion are thus designated: AH and AE, two *faces;* EF and GH, two *flanks;* A, the *salient;* FG, the *gorge;* and H and E, the *shoulders.* *mn* is the *rampart;* *mo*, the *parapet* on the rampart; QPQ', the *ditch;* NO, the *covert-way;* RWR', the *glacis;* KLL', a *ravelin.*



**CU'RTIUS**, METTUS or METIUS, a noble Roman youth who (according to tradition) heroically sacrificed his life for the welfare of his country, 362 B.C. A chasm, it is said, had opened in the forum or market-place in Rome, and the soothsayers predicted that some great calamity would happen if there were not thrown into the chasm the best wealth of the state. While it was proposed to consult the oracles, and determine what this best wealth could be, C. appeared on horseback and in full armour, and exclaimed: 'Rome has no greater riches than courage and arms.' He then rode over the precipice into the chasm, which immediately closed over him.

**CURTIUS**, RUFUS QUINTUS, a Roman historian, author of the work *De Rebus Gestis Alexandri Magni*, in ten books, of which the first two have been lost, and the text of the remainder has come down to us in a damaged condition. Great differences of opinion have existed with regard to the time in which C. wrote, for his name is first mentioned by writers after the 12th century. Some critics have supposed that C. lived in the reign of Augustus; others, that he wrote in the 2d c., or under Constantine or Theodosius; while some regard the work ascribed to C. as a composition of the 13th century. The most probable opinion is that he flourished in the time of Vespasian. The value of the work is as dubious as its authorship. C. had a very inaccurate knowledge of geography, chronology, military tactics, astronomy, and historic criticism; hence his work is far from being reliable as a whole. The style, though declamatory, is on the whole pure and elegant. The first edition of C.'s history was published at Venice about 1471. Among modern editions may be mentioned Mützell's (Berlin, 1841) and Zumpt's (Brunswick, 1849).

**CU'RVATURE.** The C. of a plane curve at a point is its tendency to depart from a tangent to the curve at that point. In the circle, this tendency is the same throughout, for the curve is perfectly symmetrical round its centre; in other words, the C. of a circle is constant. In different circles, the C. is inversely as the radius—i. e., it diminishes as the radius increases. The reciprocal of the radius is accordingly assumed as the measure of C. of a circle. A straight line, which has no C., may be considered part of a circle whose radius equals infinity as the reciprocal of infinity, measures the C., and is = 0. The annexed fig. shews how the circle of smaller radius bends more rapidly away from the tangent than that of larger radius.



The constancy of C. in the circle suggests an absolute measure of C. at any point in any other curve; for whatever be the C. at that point, we can always find a circle of the same curvature. The radius of the circle which has the same C. at any point in a curve as the curve itself at that point, is called the radius of C. of the curve for that point; and the circle itself is called the *osculating* circle. If we know the radius of C. of a curve at different points, we can compare its C. at those points. We have thus the means also of comparing degrees of C. in different curves.

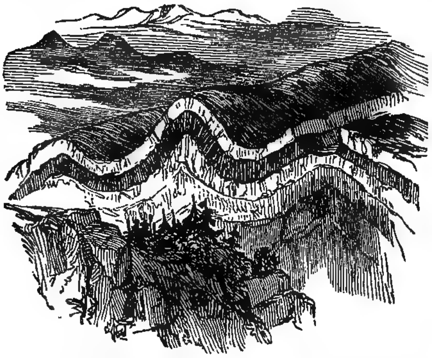
The problem of measuring the C. of a curve at any point is the same, then, with that of finding its radius of curvature. In some simple cases, as in the conic sections, this may be done geometrically; it is usually necessary, however, to employ the calculus. If the curve be referred to rectangular co-ordinates, and $x$, $y$ be a point in it, then it can be shewn that radius of C. $= \dfrac{\left(\dfrac{1 + dy^2}{dx^1}\right)^{\frac{3}{2}}}{\dfrac{d^2y}{dx^2}}$. If the curved line, instead of being plane, twists in space, it is called a curve of double curvature. See CONTACT and OSCULATING CIRCLE.

**CURVE** means, in common language, a crooked line that departs gradually from the straight direction; in mathematics, however, it is usually restricted to lines that follow some law in their change of direction. Thus, the law of the circle is, that all points of it are equally distant from a fixed point, called the centre. The law of a plane curve is generally expressed by an equation between the co-ordinates of any point in it referred to a fixed point. See CO-ORDINATES. When the equation of a curve contains only powers of $x$ and $y$, the curve is algebraic; when the equation contains other functions, logarithms, for instance, of $x$ and $y$, the curve is called transcendental. The cycloid, e. g., is a transcendental curve.

There are also curves, like the spiral, that do not continue in one plane; these are called curves of double curvature. To express the law of such a curve requires three co-ordinates and two equations.—Curves are said to be of the first, second, third, &c., order, according as their equations involve the first, second, third powers of $x$ or $y$. The circle, ellipse, parabola, and hyperbola are of the second order of curves. There is only one line of the first order, namely, the straight line, which is also reckoned among the curves.—The higher geometry investigates the amount of curvature of curves, their length, the surface they enclose, &c.

The number of curves that might be drawn is of course infinite. A large number have received names, and are objects of great interest to the mathematician—in some cases, for their beauty, in others, for their remarkable properties. Among the most interesting are the following: 1, circle; 2, ellipse; 3, hyperbola; 4, parabola; 5, cissoid of Diocles; 6, conchoid of Nicomedes; 7, lemniscata; 8, cycloid; 9, harmonic curve; 10, trochoid; 11, the witch; 12, cardiode; 13, curves of circular functions—e. g., curve of sines; 14, the logarithmic curve; 15, the spiral of Archimedes; 16, the catenary; 17, the tractory; 18, the tractrix; 19, the ovals of Cassini; 20, the reciprocal spiral.

**CURVES**, Anticlinal and Synclinal, are terms applied to the elevations or depressions in undulating strata. The ridge-wave is called the anticlinal curve, and the top of the ridge is known as the anticlinal axis; whilst the trough is the synclinal curve, and the bottom of the trough the synclinal axis. In the annexed section of the Jura Mountains, three anticlinal and two synclinal axes are seen.



**CURZO'LA** (ancient, *Corcyra Nigra*, so called from the sombre colour of its pine forests), an island of the Adriatic, forming a part of the Austrian crown-land of Dalmatia, in lat. 42° 57′ N., long. 17° E. It has a length of about 25 miles, with an average breadth of 4 miles. It is well covered with wood, which on the south coast grows down to the water-edge. The woods furnish ship-timber, a considerable quantity of wine is raised, and the fisheries of the coast are productive. The population numbers altogether 6500, about 2000 of whom are located in the town of C., at the north-east extremity of the island.

**CUSCUS.** See Lemon Grass.

**CUSCUTACEÆ.** See Dodder.

**CUSHAT.** See Pigeon.

**CUSP** (Lat. *cuspis*, the point) is a point in a curve at which its two branches have a common tangent. If we conceive a curve to be generated by a moving point, then a C. is where the point suddenly stops and *returns* for a time in the same general direction as that in which it was moving when it reached the C. point. Cusps are of two kinds: 1, when the two branches, AB, AC, have their convexities turned in the same direction with respect to the common tangent at the C. point, as in fig. 1; 2, when they have their convexities turned in opposite directions to the common tangent at the C. point, as in fig. 2.

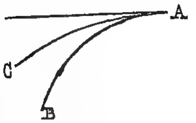


Fig. 1.

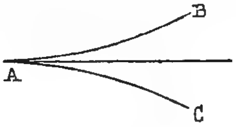
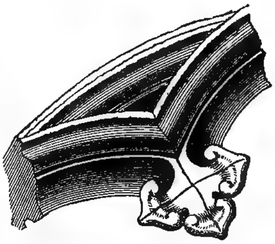


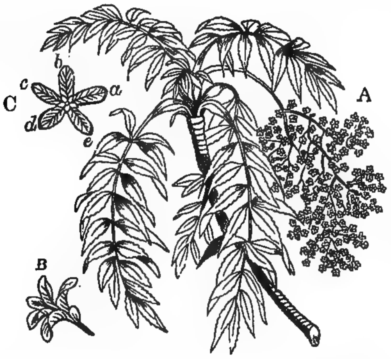
Fig. 2.

**CUSP**, in Architecture, is the point formed by the meeting of two small arches, or foils, in foil arches (q. v.), or tracery. Cusps often terminate in rich bosses of flowers and leaves.



Cusp.

**CUSSO, KOSSO,** or **CABOTZ** (*Brayera anthelmintica*, or *Hagenia Abyssinica*), a small Abyssinian tree of the natural order *Rosaceæ*, sub-order *Spiraceæ*, the dried flowers of which have been long used in Abyssinia as an anthelmintic, and have been found so efficacious in the removal of tape-worm, that they are now a much valued medicine in Europe. The flowers are simply dried, in order to be ready for the market; they have an aromatic, but not very agreeable smell, and are administered in the form of an infusion.



Cusso:
A, a branch, with leaves and flowers; B, a flower seen laterally; C, a female flower; *a, b, c, d, e*, the five outer segments of the calyx.

**CU'STARD**, a composition of milk or cream, eggs, &c., sweetened with sugar, and flavoured according to taste. Custards are of various kinds, such as plain, baked, lemon, orange, almond, coffee custards, &c. For a plain C., the following is a recipe as given by M. Soyer: Mix a pint of boiling milk with two ounces of sugar and the thin yellow peel of half a lemon; then take four eggs, beat well in a basin, and add gradually the milk, &c. (not too hot); pass the mixture through a colander, and, having filled the custard cups with it, place them over the fire in a stew-pan, containing about one inch of hot water, and leave them here until sufficiently set (about twelve minutes is the time required). With this as a basis, a variety of custards are produced by the simple addition of flavouring ingredients, as almonds, orange-peel, &c.

**CUSTARD APPLE**, the name commonly given in the West Indies and other tropical countries to the fruits of certain species of *Anona*, a genus of trees of the natural order *Anonaceæ* (q. v.). Some of the fruits of this genus are among the most delicious produced in tropical countries, as the Cherimoyer (q. v.), and even the common C. A. (*A. reticulata*), which is regarded as a native of America, but is now very common throughout the East Indies, the variety cultivated in the Eastern Archipelago being very superior even to the West Indian. The C. A. is a large, dark-brown, roundish fruit, sometimes from its size and appearance called Bullock's Heart in the West Indies; the tree is of considerable size. Some other American species of *Anona* are sometimes called custard apples, and two or three which are natives of Western Africa. To this genus also belong the Sweet-sop, the Sour-sop, the Pinana or Pinha, all of them tropical American fruits, and the ALLIGATOR APPLE of the West Indies (*A. palustris*), a fruit of pleasant taste, but regarded as dangerously narcotic.

Custard Apple (*Anona triloba*).

**CU'STODY.** See IMPRISONMENT.

**CU'STOM**, in English Law. This is either general or particular. The principal doctrines relating to general customs have been stated under COMMON LAW. Of particular customs, it may be remarked that, in order to establish them as law, they must be proved by verdict of a jury, except the C. of the city of London, which is proved by certificate by the lord mayor, aldermen, and recorder. A particular C. must, like a general C., be established as in force for a time whereof the memory of man runneth not to the contrary. See COMMON LAW. A C. must have been uninterrupted as regards right, though the exercise of it may have been disused; it must have been held without objection, and be unopposed to other customs; it must be not unreasonable nor uncertain in operation.

**CU'STOMARY FREE'HOLD**, in English Law, a species of estate which, in all practical respects, is identical with Copyhold (q. v.), but in which the tenure is expressed to be according to the custom of the manor, without adding the words 'at the will of the lord.'

**CUSTOM HOUSE**, the office at a seaport where the customs duties (see next article) are paid, vessels entered and cleared, &c. The several custom houses in the United Kingdom have each a separate establishment of officers, according to the extent of the trade in the port to which it belongs, and the consequent exigencies of the service. The whole are, however, under the control of the Commissioners of Customs. The salaries of the various offices, and other details of the service, will be found in Parkinson's *Under Government;* Bell and Daldy, 1859.

**CUSTOMS DUTIES**, the portion of the revenue of the United Kingdom derived from a tax on imports. The origin of the term is connected with the long conflict between the crown and parliament as to the right of taxation. To meet the claims made by the House of Commons of the exclusive right to vote all supplies, it used to be maintained that there were certain duties on exportation and on importation to which the crown had acquired a right by *custom*, and after the power of parliament over this branch of taxation had been fully established, it retained its old name. This tax, after the excise came in force, was always applicable distinctively to goods changing place. There were customs not only upon things leaving and things coming to the British dominions, but also upon commodities transferred from one part to another. In Scotland, the duty on commodities imported into any town from a foreign country was called the great custom; and the duty charged by a burghal corporation on commodities coming from the country districts within its walls was called the small or petty customs. At present, the term C. D. applies solely to the tax levied on commodities imported from abroad, thus facilitating a convenient division of the sources of the British revenue into the Customs and the Inland Revenue, the latter including all other taxes.

The tax on imports was of old a simple percentage, familiarly known to the readers of English history as 'tonnage and poundage,' from the method in which it was adjusted to heavy and light goods. Subsequently, however, the notion prevailed that the C. D. might not only be a source of revenue, but an instrument for furthering the various theories about protecting this trade and discouraging that, which prevailed from time to time. When it was held as an established principle, with regard to any trade, that the customs should be adjusted in such a manner as either to aid or to impede it, the regulations regarding that trade alone would have complexity enough for a whole code of customs laws, the object of which was mere revenue. The more complex the arrangements, the more open were they to the machinations of the smuggler or defrauder, and consequently regulation had to be added to regulation, till the whole became a chaos. In some instances, the duties were such as to act as a prohibition to importation; in others, merely as a heavy increase on the price. In either case, there would be relaxations in favour of the produce of our own colonies, and perhaps of some favoured country with which we had a treaty of reciprocity. Then, to encourage our own trade and manufactures, it was considered politic to allow goods to be imported for exportation abroad, or to be imported for the purpose of being worked up into a manufacture, and there would be a difference between the extent of encouragement granted to that manufacture, if it were for home consumption or for exportation. The method in which such relaxation was accomplished was at first by charging the duty on the importation, and afterwards repaying it by what was called a 'drawback;' and this was subsequently accomplished in an easier method for the importer, by allowing him to 'bond' the goods in the government warehouses until the duty was paid, or the conditions which dispensed with it fulfilled. See WAREHOUSING SYSTEM.

In the year 1825, the laws of the British customs were consolidated into eleven acts of parliament—the fruit of the exertions of the late Mr Deacon Hume. It will give a conception of the confused and cumbersome condition into which the system had merged, to note that the number of acts repealed on the occasion of the consolidation was 443, and it was afterwards discovered that several had been omitted. There was still a long list of C. D., many of them intended for purposes beyond the mere collection of revenue; but the free-trade legislation of 1846 cleared away a great mass of this burden on the commerce of the country, and almost every year has contributed to the abbreviation of the list of duties or Tariff (q. v.). Thus simplified and reduced, the C. D. supply an enormous amount of revenue. The total receipts of the British revenue for the year 1860 were £71,967,494, 11*s.* 9*d.*, and to this amount the customs contributed £23,032,394, 16*s.* 3*d.*

The defects which, according to the doctrines now prevalent in this country, are to be avoided in a code of customs, are—1. The prohibition or discouragement of the importation of useful commodities; 2. Encouragement to the smuggler; and 3. Loss of revenue by raising the duty to the height which discourages importation. Under the first head, see ANTI-CORN-LAW LEAGUE, CORN LAWS, and FREE-TRADE. The second is connected with the view that on stimulants the duty cannot be too high, even though it should greatly impede their importation—the duty on tobacco is, in some instances, as high as 900 per cent. on the value of the article. But then, if the smuggling trade be encouraged, the stimulant is not only obtained without any contribution to the revenue, but the people become demoralised, and trained to crime. Under the third head, a memorable example is furnished by the sugar-duties of France, which were so high that the native agriculturists could make sugar from beet-root a little cheaper than the duty-paid foreign sugar. Hence the article was dear, for had it not been for the height of the duty, it would not have been worth while to make it at home, and at the same time there arose little or no revenue from it.

The collection and general management of the C. D., which used to be divided among several boards, is now under one great central department of the government in London. It consists of a chairman, deputy-chairman, four commissioners, a secretary, an assistant-secretary, and a staff of subordinate officers.

**CU'STOS ROTULO'RUM** (Lat. keeper of the *rotuli* or rolls), one of the justices of the peace of a county appointed by the crown to keep the county records.

**CÜSTRI'N.** See KÜSTRIN.

**CUTCH**, a protected principality under the presidency of Bombay, stretches along the gulf of its own name and the Indian Ocean between Guzerat and Sinde. It extends in N. lat. from 22° 45′ to 24° 40′, and in E. long. from 68° 26′ to 71° 45′, containing, in something of a triangular form with the maritime line as a base, an area of 15,364 square miles, and a population of rather more than half a million. It is divided naturally into C. Proper and the Runn of Cutch.—1. C. Proper, consisting of 6764 square miles, and numbering nearly all the inhabitants, is the belt on the sea-shore, touching Sinde, of which it may be regarded as a physical continuation, on the north-west, and being separated by a detached portion of the Runn from Guzerat on the south-east. While the southern edge of this belt is merely a sandy desert, the northern section, traversed lengthwise by two parallel ranges of hills, presents, amid much sterility, many fertile tracts, which yield cotton, rice, &c., and feed a large stock of horses, kine, buffaloes, and camels. The grand defect of the country is the scarcity of water. Hence the crops occasionally fail from the scantiness of irrigation; and at this moment, in March 1861, this region is said to be suffering more severely than almost any other in India from a nearly general famine. Timber is scarce, for the growth in the mountains is chiefly brushwood. Here and there, however, decayed trunks of great size, more particularly on the southern ridge, indicate the former existence of noble forests. The mineral productions are coal, iron, and alum. The traces of volcanic action are numerous. Earthquakes also have recently occurred; one of which, in July 1819, besides shaking every fortification to its foundations, and destroying several hundreds of people, threw up an enormous mound of earth and sand many miles in extent, and simultaneously submerged an adjacent district of corresponding size. The annual revenue of the state amounts to £73,842; and the military force consists exclusively of a body of irregular cavalry. The ruler is styled the Rao; and the feudatory chieftains under him are about 200.—2. Runn of C.—subdivided into two parts, the smaller, of 1600 square miles, on the east, and the larger, of 7000 square miles, on the north—is merely an amphibious desert, being, in a great measure, hard ground during the dry season, and then, in turn, a sort of shallow lake formed by the heavy rains and pent-up tides of the south-west monsoon. It is supposed to have been originally a permanent inlet of the ocean, and to have had its level raised by some such convulsion of nature as that which marked the year 1819. The periodical disappearance of the waters leaves behind it one continuous crust of salt. This dreary waste, however, is not without its elevated spots, the islets, doubtless, of a remoter era. But, with the exception of herds of asses and clouds of flies, animal life appears to be nearly unknown.

**CU'THBERT, ST, OF DURHAM**, one of the three great saints of England in the middle ages, the other two being St Edmund of Edmundsbury, and St Thomas-à-Becket of Canterbury. St C. was born about 635. Neither his birthplace nor his parentage has been ascertained; but a legend, which was long generally believed, told that he was born in Ireland, and drew his lineage from one of the petty kings of that country. When the light of record first falls upon him, he is a shepherd boy in the kingdom of Northumbria, which then stretched northwards to the Forth. In 651, while watching his flock by night on the heights of Lauderdale, he believes that he sees the heavens open, and a company of angels descend upon the earth, and again ascend to heaven, carrying with them the soul of St Aidan, the pious Bishop of Lindisfarne, or Holy Island. The vision determines him to become a monk, and in the same year he enters the monastery of Melrose, of which St Boisil was then provost or prior, and St Eata, abbot. When the latter removed to the newly-founded monastery of Ripon, St C. accompanied him, and was appointed to the office of superintendent of the guests. In 661, St Boisil died of the plague, which then ravaged Britain, and St C. was chosen to succeed him as provost or prior of Melrose. While in this office, he distinguished himself by his assiduity in visiting the neighbouring villages, and especially the remoter mountain hamlets, sometimes on horseback, but oftener on foot, and labouring by his teaching and example to reclaim the people from the superstitious or pagan rites into which they had fallen. After a few years spent in this way, he left Melrose for the island monastery of Lindisfarne, of which he became provost or prior, his old master, St Eata, being abbot. Longing for an austerer life even than the monastic, he quitted Lindisfarne in 676, to become an anchorite, or solitary recluse, in a hut which he built with his own hands on Farne Island. Here, in 684, he was visited by Ecgfrid, king of Northumbria, Trumuine, ex-bishop of the Picts, and other great men of the north, who came at the request of the synod of Twyford to entreat that he would accept the bishopric of Hexham. He reluctantly complies with their wishes, but his heart is still with his Northumbrian islands. He exchanges the see of Hexham for that of Lindisfarne, and still thirsting after solitude, at the end of two years he resigns his bishopric, and returns to his hut in Farne Island. Here he died on the 20th of March 687. The anniversary of his death was a great festival in the English Church, which commemorated also the 4th of September, as the anniversary of the day on which his body was translated to Durham. The influence which St C. exercised upon his age seems to have been due chiefly to his fervent piety and extraordinary asceticism. The gift of a persuasive tongue is ascribed to him, and he would seem to have had skill and prudence in the management of affairs, but nowhere is there any trace of his learning.

The fame of St C. had been great during his life; it became far greater after his death. Churches were dedicated to him throughout all the wide country between the Trent and Mersey on the south, and the Forth and Clyde on the north. When his tomb was opened at the end of eleven years, it was believed that his body was found incorrupt, and so, for more than 800 years, it was believed still to continue. It remained at Lindisfarne till 875, when the monks, bearing it on their shoulders, fled inland from the fury of the Danes. After many wanderings through the south of Scotland and the north of England, it found a resting-place at Chester-le-Street in 882. It was transferred to Ripon in 995, and in the same year it was removed to Durham. Here, enclosed in a costly shrine, and believed to work daily miracles, it remained till the Reformation, when it was buried under the pavement of the cathedral. The grave was opened in 1827, when a coffin, ascertained to have been made in 1541—when the body was committed to the earth—was found to enclose another, which there was reason to suppose had been made in 1104; and this again enclosed a third, which answered the description of one made in 698, when the saint was raised from his first grave. This innermost case contained, not, indeed, the incorruptible body of St C., but his skeleton, still entire, wrapped in five robes of embroidered silk. Fragments of these, and of the episcopal vestments, together with a comb and other relics, found beside the bones, are to be seen in the cathedral library. The asceticism which distinguished St C. in life, long lingered round his tomb. Until the Reformation, no woman was suffered to approach his shrine; the cross of blue marble still remains in the cathedral floor which marked the limits beyond which female footsteps were forbidden to pass, under pain of instant and signal punishment from the offended saint. His wrath, it was believed, was equally prompt to avenge every injury to the honour or possessions of his church. It was told that William the Conqueror, anxious to see the incorrupt body of the saint, ordered the shrine to be broken up; but scarcely had a stroke been struck, when such sickness and terror fell upon the king, that he rushed from the cathedral, and, mounting his horse, never drew bridle till he had crossed the Tees. A cloth, said to have been used by St C. in celebrating mass, was fashioned into a standard, which was believed to insure victory to the army in whose ranks it was carried. Flodden was only one of many fields in which the defeat of the Scots was ascribed to the banner of St Cuthbert. It hung beside his shrine until the Reformation, when it is said to have been burnt by Calvin's sister, the wife of the first Protestant dean of the cathedral.

The life of St C. was twice written by the Venerable Bede—briefly in vigorous hexameters in his *Liber de Miraculis Sancti Cuthberchti Episcopi;* at greater length, in prose, in his *Liber de Vita et Miraculis Sancti Cudbercti Lindisfarnensis Episcopi.* In this latter work, he made use of an earlier life by a monk of Lindisfarne, which is still preserved. Besides these lives—all of which have been printed more than once—and what is told of St C. in Bede's *Historia Ecclesiastica Gentis Anglorum,* the chief ancient authorities are the *Historia Translationis S. Cuthberti,* published by the Bollandists in the *Acta Sanctorum, mens. Martii,* vol. iii.; the *Libellus de Exordio Dunhelmensis Ecclesiæ* by Symeon of Durham; the *Libellus de Nativitate S. Cuthberti de Historiis Hybernensium excerptus,* and the *Libellus de Admirandis B. Cuthberti Virtutibus,* by Reginald of Durham, both published by the Surtees Society. There are two modern memoirs of St C.—the late Rev. James Raine's *St Cuthbert* (Durham, 1828), and the Very Rev. Monsignor C. Eyre's *History of St Cuthbert* (Lond. 1849).

**CUTHBERT,** a disciple of the Venerable Bede in the monastery of Jarrow, of which he himself was afterwards abbot, was present at the death of his master in 735, and has left a beautiful and touching relation of the event in a letter to his fellow-disciple, Cuthwine. It has been often printed; the best editions are those in Twysden's *Decem Scriptores* (Lond. 1652), and in Stevenson's edition of Bede's *Historia Ecclesiastica* (Lond. 1838).

**CUTHBERT OF CANTERBURY,** a native of the kingdom of Mercia, became Bishop of Hereford in 736, and Archbishop of Canterbury in 740. He died in 758. An instructive letter was addressed to him by St Boniface (or Winfrid) on the ecclesiastical abuses of the age. It has been printed more than once, and will be found in the appendix to the late Professor Hussey's edition of Bede's *Historia Ecclesiastica* (Oxon. 1846).

**CUTHBERT'S BEADS, St.** See Beads.

**CU'TICLE.** See Skin.

**CU'TLASS** is a sword about 3 feet long, broad and straight, with a japanned hilt. Cutlasses are mostly used by sailors in the navy, when boarding and taking possession of the enemy's ships.

**CU'TLERY,** the general name for all kinds of cutting instruments, such as knives, forks, scissors, razors, &c. The workman who makes these is called a cutler; the sword-maker, a sword-cutler; but the manufacturer of workmen's tools is called a 'tool-maker,' or a '*steel toy-maker,*' not a cutler. In Birmingham, for example, such implements as hammers, chisels, pincers, hatchets, &c., are technically called toys.

Shells, flints, and other sharp-edged stones formed the rudest and most ancient cutting instruments, and the earliest traces of human existence upon our island and elsewhere, are associated with stone 'celts' and other weapons and cutting implements. These were followed by bronze weapons and implements, which were in use among the Romans for some purposes up to about the time of the Christian era, bronze surgical instruments having been found at Pompeii. This bronze, like steel, could be made soft for working into shape, and then hardened, but by the opposite means used for hardening and softening of steel, bronze being softened by sudden cooling from a red heat, and hardened by slow cooling. Some cities in Spain and the north of Italy acquired a high reputation for the manufacture of cutting instruments, more particularly swords, during the middle ages, when the chivalry of the period sought the best equipments. Latterly, all countries have been outstripped by England as regards tastefulness, excellence, and cheapness in cutlery. In this kind of manufacture, the lead is taken by Sheffield, which had gained a name for its *whittles* as early as the reign of Richard I. Why, with their ingenuity, taste, and skill in the arts, neither the French nor Belgians succeed in their C., would be difficult to explain. Certain it is that their C. is comparatively inferior as regards temper and finish, while their apparent incapability of making the delicate hinges and springs of clasp-knives has provoked repeated remark. At the same time, it is to be allowed that foreign C. is rapidly improving, particularly in table-knives, on which a few years have made a great difference in France. In the manufacture of American axes, Canada has made most marvellous advances, its produce as respects this article excelling that of England.

Good *table-knives* are made of steel and iron welded together; the tang, which goes into the handle, and the shoulder, are of iron, and the blade of steel. The tang and shoulder are forged from bar-iron, and the blade from shear or cast steel. Knife-blades, razor-blades, and other small articles, are usually forged into their required shape while still attached to the bar, which serves for the workmen to hold them by, and is called the 'porter.' When the bar becomes too short, it is grasped in a pair of tongs held close by a ring which clamps them by sliding up their conical handles. Two men are employed in forging such work, which is said to be 'two-handed.' The principal workman, or 'fireman,' uses a small hammer of 2 to 4 lbs. weight, while the 'hammerman' wields the sledge-hammer, weighing from 10 to 15 lbs. The 'fireman,' who attends the heating as well as the anvil-work, directs the hammerman, whose blows merely follow those of the small directing hammer of the fireman. In *drawing down* or *reducing* a bar both in length and width, the flat face of the hammer is used; but when the length or breadth alone is to be extended, only the 'pane' or narrow edge of the hammer. The concavity of razor-blades is made by hammering the blade on a small round-faced anvil; the notch or 'nail-hole' of a penknife is struck by means of a chisel of the required form. Superior work, such as razor-blades, are *smithed* after forging—that is, beaten upon an anvil, to condense the metal as much as possible—and slightly ground or *scorched* on a rough stone, to finish the shaping, and remove the 'scale' or black oxidised surface, which would interfere with the colour of the tempering. Common knives are made entirely of iron, and the difference of price arises not merely from the difference of cost of the material, but from the greater facility of working. It should also be understood that, in many articles composed of steel welded to iron, the saving of steel is not the only advantage, for steel being more brittle than wrought iron, it is very desirable, in all articles subject to a transverse breaking strain or to concussion, that every part except the cutting or working edge should be of iron. Thus, a hatchet made entirely of steel would be far less durable than one of iron with a welded steel cutting-edge. A table-knife with a steel tang would be weaker than one with an iron tang. Hammers should only be *faced* with steel, &c.

The great usefulness of steel for all kinds of implements used for cutting or exposed to wearing friction, depends upon its property of acquiring a high degree of hardness when heated and suddenly cooled, and of then being capable of softening again in various degrees by reheating moderately. See TEMPERING OF STEEL.

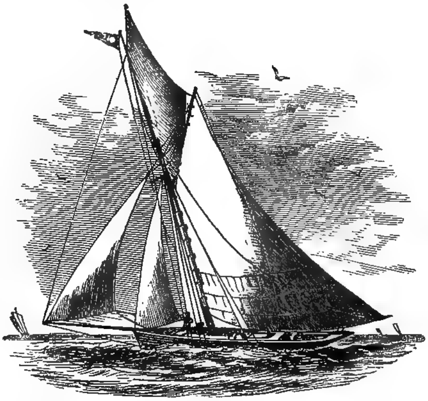
Table-forks are forged rudely into the shape of the tang and shank, first as though but a single thick prong were required; the part for the prongs is then beaten out, and a stamping-die is brought down upon it, which forms the prongs, with a thin film of steel between them; this is cut out by a cutting-die. Then they are softened and filed up, again hardened, and tempered, and ground, to smooth and finish. The dry-grinding of forks, needles, &c., is a very deleterious trade, on account of the particles of steel which enter the nostrils of the workmen, and produce most painful irritation, followed by a peculiar disease called 'grinders' asthma,' which is said to shorten life so seriously that few dry-grinders, exposed to the steel dust, reach forty years of age. Many remedies have been proposed for this. A magnetic mouthpiece was invented; but the workmen would not wear it, on account of its novelty, its grotesque appearance, the trouble of cleaning it, and the belief that if their trade were made more healthy, greater numbers would enter it, and wages would be reduced. A revolving fan, which sets in motion a current of air, that is carried by a pipe to the outside of the building, has been used, but the introduction of this has met with much opposition from the workmen. The use of wet stones would, of course, entirely obviate the evil, but they are not applicable to many kinds of work, especially that which is ground before hardening, as the stone wears away very rapidly under these circumstances.

Penknives and other pocket-knives are the work of many hands. Besides the blades, there are the separate pieces of the spring, the handle, rivets, &c., the making of each of which is a distinct trade. All these pieces are finally fitted and put together by the finisher; a good two-bladed knife passes through his hands from 70 to 100 times. The difference in the amount of labour bestowed on the best and the commonest C. is very remarkable, and the difference of price is of course proportionate. Scissors are sold as low as 2½*d.* per dozen pairs, table-knives and forks at 1*s.* 10*d.* per dozen pairs, razors at 1*s.* 6*d.* per dozen.

**CUTTA'CK** ('Royal Residence'), the capital of a district of its own name, in the sub-presidency of Bengal, stands immediately below the bifurcation of the Mahanuddee, thus occupying the very apex of the delta of that river. The advantage, however, of this position, in a political and commercial point of view, seems to be in a measure neutralised by the cost of providing against the encroachments of the bordering streams. With an estimated population of 40,000, the city has no pretensions to architectural beauty. It has very little trade; and its manufactures are principally shoes and brass cooking-vessels. C. is 220 miles south-west of Calcutta, in lat. 20° 28′ N., and long. 85° 55′ E.

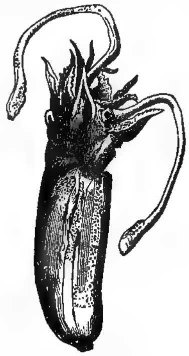
**CUTTACK**, the district, lies on the north-west coast of the Bay of Bengal, extending in N. lat. from 19° 40′ to 21° 45′, and in E. long. from 85° 8′ to 87° 31′; area, 7635 square miles. The population has been officially stated at 2,127,555. The Mahanuddee is the main river, its delta being wholly comprised within the district. Among the natural features of the country, the most remarkable is the Chilka Lake, which is, for many miles, separated from the sea by a strip of sand not more than 300 yards wide. Next to the capital, the chief towns, reckoning from the south, are Pooree, with its temples of Juggernauth, at the mouth of the most southerly arm of the Mahanuddee; Kanarak, or the Black Pagoda, about twenty miles further to the north; and Balasore, which gives its name to a roadstead stretching along the coast as far as the Hooghly. Among seamen, this maritime tract is generally distinguished as Orissa. The trade of the district is inconsiderable. Iron ore is said to be found.

**CUTTER** is a name given to two kinds of small vessels. The cutters used by yachtsmen, smugglers, and revenue cruisers, and which are built with especial reference to speed, have a single mast, and a straight running bowsprit that can be run in on board occasionally. They are much like sloops in rig, but have larger sails. Such small vessels occasionally venture on long voyages. In 1857, the *Charter Oak*, a C. of 23 tons, crossed the Atlantic from New York to Liverpool; and, in 1858, the *Christopher Columbus*, a C. of 45 tons, with a crew of only two boys, besides the owner, performed the same voyage in 45 days. The cutters belonging to ships of war are clincher-built boats, from about 24 to 28 feet in length, employed for various purposes; they weigh from 10 cwt. to 24 cwt. each. Two such cutters are supplied to every ship of war, except those of the smallest kinds.

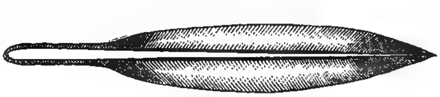


Cutter.

**CUTTINGS** are branches or portions of branches of trees or shrubs, employed to produce new plants, by the insertion of the lower end into the earth. By care, and in the most favourable circumstances, almost any tree or shrub may be propagated by C., but some only with great difficulty, and soft-wooded trees or shrubs most easily. Nothing is more easy than to propagate willows, fuchsias, currants, gooseberries, &c., in this way; but many other plants, commonly propagated by C., require greater attention on the part of the gardener, warmth, a uniform damp atmosphere, and shade. Some kinds of apple are occasionally propagated by C., and in warmer climates than that of Britain, this mode of propagation is found suitable for a greater number of kinds. C. are most advantageously taken from branches of which the wood is young, yet at least a year old. The top is generally cut off, and not much more left above ground than is inserted into it. Care must be taken in planting C. not to use such force as to strip off the bark. Some herbaceous plants are propagated by C., which, in pinks and carnations, are called *pipings.*



Cuttle-fish.



Cuttle-fish Bone.

**CUTTLE-FISH** (*Sepia* and *Sepiadæ*), a genus and family of cephalopodous molluscs of the order *Dibranchiata*. See Cephalopoda. The body is oblong and depressed, sac-like, with two narrow lateral fins of similar substance with the mantle. There is an internal shell lodged in a sac on the back part of the mantle, somewhat oval and blade-shaped, being comparatively thick near the anterior end, where it is terminated by a sharp point affixed, as it were, to its general outline; the whole shell is light and porous; it is formed of thin plates with intervening spaces divided by innumerable partitions; and consists chiefly of carbonate of lime with a little gelatinous and other animal matter, which is most abundant in the *phragmocone*, or internal harder part of the shell, where also the laminæ and partitions are closer than in the outer part. The eyes are very large, and the head is furnished with eight arms, each of which has four rows of suckers, and two long tentacles expanded and furnished with suckers on one side at the extremity. The Common C. (*Sepia officinalis*) is abundant on the British coasts. Its skin is smooth, whitish, and dotted with red. It attains the length of a foot or more. It is one of the pests of fishermen; often, along with calamaries, partially devouring the fish which have been caught in their nets. In Scotland, the fishermen call it the O fish. It is not itself easily caught, being very active in making its escape by swimming, and also promptly throwing out its ink to darken the water around it. It is sometimes cast upon the shore, but far more frequently its bone, which is used for making pounce, tooth-powder, &c., for forming moulds for small silver castings, for polishing, and for other purposes in the arts; and was formerly often used in medicine as a corrective of acidity in the stomach, for which purpose, however, it is no better adapted than any other form of carbonate of lime. The ink of the C. furnishes the valuable pigment called *Sepia* (q. v.), which is said by some chemists to contain a peculiar animal principle called *Melanine* (Gr. *melas*, black), and is wonderfully indestructible. Dr Buckland indeed found the pigment remaining in fossil molluscs akin to the C. to be fit for use, and to make excellent sepia, notwithstanding all the unreckoned ages that had elapsed from the time of its secretion by the living organisms.—The eggs of the C. are not unfrequently cast ashore, clustered together like grapes, and are known to the frequenters of the coast as *Sea-grapes.*—The flesh of the C. was esteemed by the ancients. A receipt for making a C. sausage will be found in Athenæus.—Numerous species of C. inhabit different seas.

**CUVIER**, Georges Chrétien Léopold Dagobert, Baron, was born August 23, 1769, at Mömpelgard, a town then belonging to Würtemberg, but now to France. His father was an officer in a Swiss regiment. Having made rapid progress in learning at the Mömpelgard gymnasium, C. entered, in 1784, the Karlsakademie at Stuttgart. Here, in the midst of various studies, he retained that predilection for natural history which he had displayed when only twelve years old. The restricted means of his parents, however, compelled him, in 1788, to take a situation as private tutor in the family of Comte d'Héricy, who resided near Fécamp, in Normandy. Here C. lived for six years, quietly but ceaselessly pursuing his studies in natural history. An acquaintance accidentally formed between him and the Abbé Tessier (noted as a writer on agriculture), was the cause of C.'s obtaining an introduction to Geoffroy St Hilaire and other eminent Parisian savans. Startled by the novelty and comprehensiveness of his views on zoology, Geoffroy St Hilaire urged him to come to Paris, which he did, and, in 1795, was appointed professor in the Ecole Centrale of the Panthéon. Soon after this appointment, C. was made assistant to Mertrud, the teacher in comparative anatomy at the Jardin des Plantes, and now he began to form that collection in natural history which ultimately became the largest in Europe. In 1796, he was made a member of the National Institute; in 1800, he succeeded Daubenton in the Collége de France; and, in 1802, was made perpetual Secretary of the Institute. He gradually rose in the estimation of the Emperor, and, in 1808, was commissioned to superintend the institution of academies in the new territories attached to France. Shortly before the fall of Napoleon, C. was admitted into the Council of State. The Restoration did not deprive him of his honours, but added to them; he was made Chancellor of the University of Paris, and, henceforward, received from time to time new rewards for his services to science. After a visit to England (1818), where he was received with great honours, he was, in 1819, admitted into the cabinet by Louis XVIII., and, in 1826, was made Grand Officer of the Legion of Honour; but his decided opposition to the royal measures for restricting the freedom of the press, lost him the favour of Charles X. Under Louis Philippe, he was made a peer of France in 1831, and in the following year was nominated Minister of the Interior, when he was suddenly attacked with paralysis, of which he died, May 13, 1832.

It is difficult, in our narrow compass, to give a summary of the merits of C., so various were his attainments, so great was his success in so many departments. He laid the foundation of the now universally recognised method of classification in Zoology (q. v.), and raised comparative anatomy (which until his time had been merely a heap of unconnected details) to the dignity of a science. After a long series of patient observations on numerous animals, especially the hitherto little-known order of mollusca, he published (1801—1805) his *Leçons d'Anatomie Comparée*, which was completed by the *Mémoire pour servir à l'Histoire de l'Anatomie des Mollusques* (1816). With admirable sagacity, he applied the principles of his Comparative Osteology to the remains of fossil vertebrate animals, and thus opened a field of investigation in which numerous explorers have since successfully laboured. His *Recherches sur les Ossements Fossiles des Quadrupèdes* (1821—1824) is a mine of information in natural history, and affords the strongest arguments in favour of the theory of a progressive series of animals, advancing from the most simple to the most complex forms of organisation. C.'s rare faculty of expressing scientific truths in a popular and elegant style, was displayed in his celebrated *Discours sur les Révolutions de la Surface du Globe et sur les Changements qu'elles ont produits dans le Règne Animal* (latest edition, Paris, 1851). This discourse was published as an introduction to the above-named *Recherches sur les Ossements Fossiles*. In concert with Valenciennes, C., in 1828, commenced a *Natural History of Fishes*, which was founded on the largest ichthyological collection ever made by an individual. It was continued by Valenciennes. Lastly, we may notice the éloges delivered by C. (and published in the *Recueil d'Eloges Historiques*, 1819), as valuable contributions to the history of science.

In public life, C. was as remarkable for activity as in the quiet work of the study. He never blindly surrendered himself to any party, but at all times gave proof of an honest, sagacious, and resolute character. In his plans for the extension and improvement of national education, he was zealous and indefatigable, as also in his efforts for the welfare of the Protestant Church in France, of which he was a member.—Mrs R. Lee's *Memoirs of Baron C.* (Lond. 1833); Pasquier's *Eloge de C.* (Paris, 1833).

**CUXHA'VEN**, a town of Germany, situated on the left or southern bank of the Elbe, just where it is lost in the German Ocean. It is about 60 miles distant from Hamburg, to which free city it belongs. C. is a small place, but of importance as the port from whence the Hamburg steamers ply when in winter the Elbe is frozen over. The harbour affords good shelter, and is much resorted to by vessels waiting for favourable winds. Pilots for the Elbe are taken in here. Pop. 1200.

**CUYA'BA**, capital of Matto Grosso, the largest and most westerly province of Brazil, occupies pretty nearly the centre of South America, being in lat. 15° 36′ S., and long. 56° W. It stands on the left bank of a river of the same name, and is estimated to contain about 10,000 inhabitants. Its comarca, which numbers 25,000 inhabitants, has yielded gold and diamonds since 1719. In addition to these precious commodities, C. sends to Rio, the principal seaport of the country, large quantities of hides and ipecacuanha by caravans of 200 or 300 mules each. The chief edifices of the city are its three churches, an hospital, a school of philosophy, and the public buildings of the province.

**CUYP**, or **KUYP**, Jacob Gerritse, commonly called the Old C., was born at Dordrecht in 1575. Jacob C.'s representation of cows and sheep, battles and encampments, are clever, but his fame rests principally upon his excellent portraits. His colouring is warm and transparent: his manner, free and spirited. C. died in 1650.—Aelbert Cuyp, Jacob's son, was also born at Dordrecht, in 1605. He excelled in the painting of cattle grazing or reposing, moonlights, wintry landscapes, still waters with ships, horse-markets, hunts, camps, and cavalry-fights. During his lifetime and long after, Aelbert's pictures, although in many respects equal to those of Claude, were held in little estimation. Opinion, however, has now changed regarding them. One of his still waters, which was sold in 1777 for 416 guilders (£34, 13*s.* 4*d.*), brought 12,720 guilders (£1060) in 1844. England is particularly rich in his works. He died at Dordrecht, 1691.—Benjamin Cuyp, a nephew of Aelbert, lived at Dordrecht, and painted biblical pieces in Rembrandt's style, and familiar scenes of country-life. His best works are in the manner of Teniers. His sea-shores have less repute. The dates of his birth and death are unknown, but, from the multitude of his pictures, it is conjectured that he lived to a great age.

**CU'ZCO**, the name of a city, a province, and a department in Peru. 1. C., the city, was originally the capital of the Incas (in the language of the Incas, says Garcilasso, C. signifies 'naval') and the centre of an empire, which, besides the territory of the existing republic, comprised Bolivia, most of Ecuador, and portions also of Chili and the Argentine Confederation; and is still, next to Lima, the most populous city in the state, containing fully 47,500 inhabitants. It stands on the Guatanai, one of the remotest headwaters of the Amazon, in lat. 13° 31′ S., and long. 72° 2′ W., occupying the eastern extremity of that section of the Andes which is known as the Knot of Cuzco. Notwithstanding its aboriginal name, C., with the exception of some neighbouring ruins, part of which, perhaps, carry one back beyond the era of the Incas, is really of Spanish origin, being built in the form of a square, and presenting many handsome edifices. It is about 200 miles to the north-north-east of Arequipa, having its maritime outlet in Islay, the port of that city. The manufactures of the place are cottons, woollens, embroidery, and jewellery.—2. The province, otherwise styled the Cereado, embraces nothing beyond the city itself but the suburb of San Jeronimo.—3. The department, subdivided into 11 provinces, lies wholly in the sierra or Andine region of the country, having the coast on the west, and the montana, or Transandine territory, on the east. It numbered, in 1853, 346,211 inhabitants, being considerably more populous than any other department. It stretches in S. lat. from 13° to 15°, and in W. long. from 70° to 73°, with an area of about 45,000 square miles. In addition to C. itself, it has the towns of Abancay and Urubamba.

**CY'AMUS BALÆNA'RUM.** See WHALE LICE.

**CYA'NIC ACID** is a compound of cyanogen (q. v.) and oxygen along with water, and is represented by the symbol $C_2NO$,HO, or CyO,HO.

**CY'ANITE, KYANITE** (Gr. *kyanos*, blue), **DISTHENE**, or **SAPPARE**, a mineral composed of alumina and silica. It often occurs crystallised, and generally in broad prisms. It is sometimes colourless, red, yellow, &c., but frequently of a fine sky-blue, slightly tinged with violet; it is transparent, and sometimes beautifully opalescent. It occurs chiefly in mica-slate, talc-slate, and granite; is found in different parts of Europe, Asia, and America, and in several places in Scotland. It is sometimes used as a gem.

**CYA'NOGEN** ($C_2N$ or Cy) is a compound organic salt radical, which is mainly interesting as being the principal component of hydrocyanic or prussic acid. It is most easily prepared by heating the cyanide of mercury (HgCy) or the cyanide of silver (AgCy) in a tube, when the C. is evolved as a gas at ordinary temperatures, but can be condensed by cold and pressure into a thin, colourless liquid, which freezes at −30° F. Gaseous C. has a specific gravity of 1806 (air = 1000), is inflammable, and burns in air or in oxygen with a characteristic purple or rose tint; is soluble in water to the extent of 4 to 5 volumes of the gas in 1 of water. It combines with metals, such as potassium, to form a class of important cyanides, as the cyanide of potassium. See POTASSIUM, HYDROCYANIC ACID, &c.

**CYANOHY'DRIC ACID.** See HYDROCYANIC ACID.

**CYANO'SIS** (Gr. *kyanos*, blue), lividity of complexion, with fulness of the capillaries and minute veins, especially of the face and lips. A name characteristically applied to the colour in certain cases of congenital disease or malformation of the heart. See HEART, DISEASE AND MALFORMATION OF.

**CYA'NOTYPE PRO'CESSES**, in Photography, are those in which the compound radical cyanogen is employed; they were discovered by Sir John Herschel, and depend for their successful practice on the reduction of a persalt of iron to the state of protosalt, by the action of light, in the presence of organic matter.

Good paper is immersed in a solution of ammonio-citrate of iron of the strength of 40 grains to 1 ounce of water; it is then dried, and exposed—at any convenient time during a fortnight—under a negative, when a picture of a pale brown tint becomes faintly visible upon a yellow ground; it is then brushed over with a solution of ferrocyanide of potassium (yellow prussiate of potash), which develops the picture of a deep blue tint; and this may be further deepened by immersion in a solution of carbonate of soda, which has the effect, at the same time, of removing the unaltered ammonio-citrate, and permanently fixing the picture. Similar results may be obtained by employing ferridcyanide of potassium (red prussiate of potash), or a mixture of the ferridcyanide and ammonio-citrate, in which latter case the paper is sensitive as soon as treated with the mixed solutions, and must therefore be dried in the dark. To fix the picture, it is only necessary to wash with water. A subsequent treatment with a weak solution of proto-nitrate of mercury, has the effect of apparently removing the whole of the picture. If the mercury salt, however, be perfectly washed away, and the picture dried, and ironed with a very hot iron, it is speedily reproduced in all its vigour.

**CYANU'RIC ACID** is an organic acid allied to cyanic acid, and having the formula $C_6N_3O_3$,3HO, or $Cy_3O_3$,3HO. It is obtained by heating urea to expel ammonia, or by the destructive distillation of uric acid.

**CYA'THEA**, a genus of Ferns (q. v.), of the suborder *Polypodiaceæ*, containing many species, natives of tropical and sub-tropical regions, both of the Old and of the New World. They are tree-ferns, and some of them have lofty stems and gigantic fronds; they are generally also characterised by great gracefulness and beauty. *C. arborea*, sometimes designated the Common Tree-fern, is a native of the West Indies, Brazil, &c. The fronds are bipinnate, the pinnules deeply pinnatifid. The roots of *C. medullaris*, a species found in New Zealand, contain much starch, and are baked and used as food.

**CYATHOPHY'LLUM**, a genus of fossil stony corals, with a simple or branched polyparium, internally lamellated, the lamella having a quadripartite arrangement. The older portions are cut off by transverse 'tables' or septa, and the base of the stem is often supported by root-like processes. This genus was especially abundant in the Devonian measures, 36 species having been described from them. It made its first appearance in the Silurian seas, and perished at the close of the carboniferous epoch.

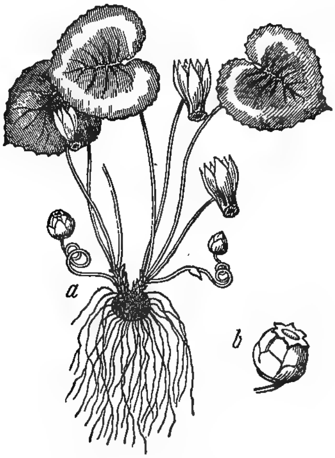
**CY'BELE.** See RHEA.

**CYCADA'CEÆ**, or **CYCA'DEÆ**, a natural order of exogenous plants, consisting of small trees and shrubs, somewhat resembling palms in their general appearance, but much more nearly allied to *Coniferæ* (pines, firs, &c.) in their botanical characters; C. being one of the few orders placed by Lindley along with *Coniferæ* in his class of *Gymnogens* (q. v.). The stems are generally simple, and either cylindrical or short and spheroidal; sometimes they are branched by successive forkings; they are much marked with scars of leaf-stalks; they consist internally of a mass of pith traversed by woody bundles, and rings of woody matter. The leaves are large and pinnated, and unfold by unrolling, like the fronds of ferns. This curious and beautiful order contains about fifty known species, natives of tropical and sub-tropical countries. None are found in Europe. They all have a mucilaginous nauseous juice, but with this there is often much starch, which being separated, forms a wholesome article of food. A kind of sago is made in Japan from the cellular substance which occupies the interior of the stem of *Cycas revoluta*, in the Eastern Peninsula from *C. pectinata*, and in the Moluccas from *C. circinalis*. From these species, which are trees 30—40 feet high, there exudes a transparent gum, resembling tragacanth in its properties. Their nuts are also eaten, after being fermented and roasted. The large seeds of *Dion edule* afford a kind of Arrow-root in Mexico; and a starchy substance, sometimes called Arrow-root, and sometimes Sago, is obtained from *Zamia pumila* and other dwarf species in the West Indies. Caffer Bread (q. v.) belongs to this order.—Fossil C. are numerous, and occur in some of the oolitic and other strata in England.

**CY'CHLA**, a genus of fishes of the family *Chromidæ* (included by Cuvier in the *Labridæ*, or Wrasse family), of which many species occur in the rivers of tropical America. They have small and crowded teeth, forming a large band. Some of them are reckoned among the finest fishes for the table in Brazil and Guiana. They are also remarkable for the beauty and brilliancy of their colours. Some of them are large, and some small. Allied to this genus is *Chromis*, of which one species, *C. Niloticus*, the Egyptian *Corycina* of the ancients, inhabits the Nile, and is reckoned the best fish in Egypt. It attains the length of two feet.

**CY'CLADES.** See ARCHIPELAGO and GREECE.

**CYCLA'MEN**, a genus of plants of the natural order *Primulaceæ*, having a wheel-shaped corolla, with a long reflexed limb, and flower-stalks twisted spirally downwards after flowering. The species are herbaceous perennials, not numerous, and chiefly natives of the south of Europe. They have turnip-like, partly subterranean stems, which are very acrid, but nevertheless are greedily eaten by swine, and the plants are accordingly often designated SOWBREAD. They are drastic and emmenagogue. A very stimulant ointment is prepared from them, which externally applied by friction, expels intestinal worms from children. Several of the species are frequent in our flower-gardens, on account of the beauty and fragrance of their flowers, which have the additional charm of being produced early in spring. One species only, *C. hederæfolium*, has a very doubtful claim to a place in the flora of Britain.—The active properties of the species of C. have recently been found to depend upon a peculiar principle called *Cyclamine*, which produces effects on the animal system similar to those of Curari (q. v.).

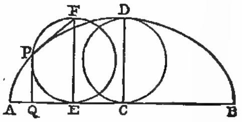


Cyclamen Europæum:
*a*, the whole plant; *b*, the fruit.

**CY'CLE** (Gr.), which means simply circle, is a term used in Chronology to denote an interval of time in which certain phenomena always recur in the same order. Cycles have chiefly arisen from the periods of revolution of the earth and other celestial bodies not being commensurable. One unit of time is the day of 24 hours, being the period of revolution of the earth round its axis. But neither the year—the period of the earth round the sun—nor the month—the period of the moon round the earth—can be measured by days, or even by hours, so exactly as not to leave fractions. Cycles have been invented to swallow up these fractions of time in whole numbers expressing days, in such a way that after a certain number of revolutions of the body whose period has been put against that of the earth on her axis, the body shall at last occupy the same place in the heavens and calendar as it did when the C. commenced. Of the numerous cycles or periods of this kind that have been invented, the more important are noticed under their specific names. See INDICTION, SOLAR CYCLE, METONIC CYCLE, JULIAN PERIOD, GOLDEN NUMBER, &c.

**CYCLOBRANCHIA'TA** (Gr. circle-gilled), an order of gasteropodous molluscs, in which the gills usually form a series of lamellæ, surrounding the body between the foot and the mantle. To this order belong the univalve *Patellidæ*, or Limpets, and the multivalve *Chitonidæ*, or Chitons.

**CY'CLOID** (Gr. circle-like). If a circle roll along a straight line on its own plane, a point on the circumference describes a curve which is called a cycloid. The curve is one of the most interesting we know in respect both of its geometrical properties and connection with dynamics. One of its most interesting properties is this: The time of a body's descending from rest from any point in the arc of an inverted C. to the lowest point is the same, from whatever point of the curve the body begins to descend. This is sometimes expressed by saying that the C. is the *isochronous* (Gr. equal-time) *curve*. The body having reached the lowest point, will, through the impetus received in the fall, ascend the opposite branch of the curve to a height equal to that from which it fell, losing velocity in its ascent by the same degrees as those by which it acquired it in its descent, and it will employ precisely the same time in ascending as it did in descending. It is clear that if a surface could be procured that would be perfectly smooth and hard, the C. would thus present a solution of the perpetual motion. The curve was discovered by Galileo in 1615. The line AB, which is called the



The Cycloid.

base of the cycloid, is equal to the circumference of the generating circle; and CD, which is the axis of the cycloid, is equal to the diameter. In any position EPF of the generating circle, AE is equal to the arc EP; AQ, the absciss, = AE − QE = arc EP − sine of EP; and PQ, the ordinate, = 1 − cosine of EP.

**CYCLOID FISHES**, an order of fishes, according to the classification proposed by Agassiz, having *cycloid* scales (Gr. *kyclos*, a circle)—scales formed of concentric layers, not covered with enamel, and not spinous on the margins. Cycloid scales are generally imbricated, but are sometimes placed side by side without overlapping. Very many of the existing fishes are of the cycloid order, and fossil C. F. are numerous in the more recent strata from the chalk upwards, but they first appear in the chalk.

**CYCLONES.** See STORMS.

**CYCLO'PEAN ARCHITECTURE**, or **MASONRY**, the name which has come to be generally used for a wall of large irregular stones, unhewn and uncemented. The term originated in Greece, where structures of this kind were fabled to have been the work of the Cyclopes, or one-eyed giants. The walls of Tiryns, near Nauplia—alluded to by Homer—are an example of the ruder style of Cyclopean masonry. They are of irregular unshapen stones, from 6 to 9 feet long, from 3 to 4 feet wide, and from 2 to 3 feet deep; the interstices are filled up by small stones, but no mortar is used. The walls of Mycenæ and of Epirus are examples of more advanced C. A.: here, the blocks, although irregular in size and shape, are fitted carefully to each other, shewing close joints and a smooth surface. These structures are now commonly believed to have been reared by the Pelasgi (q. v.), probably more than a thousand years before the Christian era. They are found not only in Greece, but in Italy and Asia Minor.

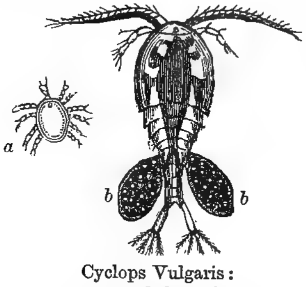
The next stage of Cyclopean masonry shews an approach to horizontal courses, as in the walls of several towns in Greece, and of some in Etruria. Lastly, the name of Cyclopean work is applied, but perhaps not quite accurately, to a kind of masonry which obtained among the Etruscans (q. v.), where the blocks are both squared and laid in horizontal courses, but are not cemented. In some cases—as in the walls of Cosa, in Tuscany, believed to have been first a Pelasgian, and then an Etruscan city—the lower part is of irregular polygonal blocks, the upper part of squared stones in horizontal courses. In at least one instance—a wall in the Peloponnesus—a foundation of excellent ashlar is surmounted by irregular polygonal blocks of the usual Cyclopean type.

Masonry, partaking more or less fully of the Cyclopean character, is to be found in Persepolis, and elsewhere in Asia, in several parts of Western Europe, and in some parts of America. The walls of Cuzco, and the ruins of what is called the house of Manco Capac, on an island in the lake of Titicaca, in Peru, are interesting examples of the C. A. of the New World. Instances of Cyclopean work on a smaller scale are to be found in the British Islands, in the walls of the primitive 'duns' or hill-forts, or in the 'cashels' or precincts of early religious houses. Among Irish examples may be mentioned the Grianan of Ailech, in the county of Donegal; Staigue Fort, in the county of Kerry; Dun Ængus, on one of the Isles of Arran, on the west coast of Galway; the Giant's Sconce, near Coleraine; and the Rock of Cashel. Among Scotch instances may be named the Laws, in the parish of Monifieth, not far from Dundee, and the ruins on St Columkille's Island, near Migsted, in Skye. In the Bibliothèque Mazarine at Paris, there is an interesting set of models of the Cyclopean buildings of Greece and Italy, by M. Petit-Radel, the author of *Recherches sur les Monumens Cyclopéens.*

**CYCLOPE'DIA.** See ENCYCLOPÆDIA.

**CYCLO'PÉS** (Gr. *kuklopes*, 'the round-eyed'), in Greek mythology, are of three kinds. 1. The Homeric C., a wild, lawless, gigantic race inhabiting the sea coasts of Sicily, the most prominent of whom is Polyphemus (q. v.). Although Homer does not directly call them one-eyed, yet he expressly terms Polyphemus such, and the later poets attribute his peculiarity to the rest. 2. The three C. mentioned by Hesiod, Brontes, Stereopes, and Arges, each having one eye in the middle of his forehead; these were sons of Uranus and Gæa, belonged to the race of Titans, and forged thunderbolts for Zeus. Hurled into Tartarus by their father, but delivered by their mother, they helped Kronos to usurp the government of heaven. Kronos, however, in his turn, threw them back to Tartarus, from which they were again released by Zeus, whose servants they now became. Finally, they were slain by Apollo, because they forged the thunderbolt with which Zeus killed Asclepius. Later tradition placed their workshop in Mount Etna, or in the volcanoes of Lemnos and Lipari, and made them the slaves of Hephæstus. 3. The C. mentioned by Strabo, as a people who had come from Thrace or Lycia to Argolis, and were distinguished for their skill as builders. Their constructions are known as the Cyclopean walls, and many of them still exist in parts of Greece and Italy. The statement of Strabo is quite untrustworthy. More probably the so-called Cyclopean walls were built by some ancient race, perhaps the Pelasgi (q. v.), at a period long anterior to the historical civilisations of Greece and Rome.

**CY'CLOPS**, a genus of minute entomostracous crustaceans of the order *Branchiopoda* (q. v.), having a soft and rather gelatinous body divided into two portions, one consisting of the head and thorax, the other forming the tail. There is only one eye, situated in the middle of the forehead, and generally of a bright crimson colour, sparkling like a gem when the animal is viewed through a microscope. The species of C. are numerous; they inhabit both the sea and fresh waters, generally residing among or upon aquatic plants. They are extremely active, and dart about with great rapidity.



Cyclops Vulgaris:
*a*, young; *b*, *b*, egg bags.

**CYCLO'PTERUS.** See LUMP FISH, and SUCKING FISH.

**CYCLORA'MA**, a series of views, which, being wound round cylinders, are made to pass in consecutive order before the spectator, so as to produce the effect of motion on his part, as the banks of a river are seen from a steam-boat, or the country from a railway.

**CYCLO'SIS** (Gr. circulation), the name employed to designate certain still very imperfectly understood movements of the contents of cells in plants. As they have been observed in plants of the most different natural orders, it is not unreasonably presumed that they prevail throughout the whole vegetable kingdom, and characterise the active life of all vegetable cells.

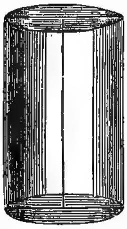
**CYDO'NIA.** See Quince.

**CY'GNET,** a young swan.—Cygnet-royal, in Heraldry, a swan gorged with a ducal coronet, having a chain thereunto affixed, and reflexed over its back.

**CY'GNUS.** See Swan.

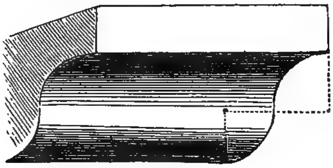
**CYGNUS** (Lat. the Swan), a constellation in the northern hemisphere, between Lyra and Cassiopeia. Several stars in this constellation have received the particular attention of astronomers. See Stars, Fixed.

**CY'LINDER** (Gr. *kylindo*, to roll) is the name of a genus of geometrical solid figures, of which there may be endless species. The most common kind of C. is that which is generated by the revolution of a rectangular parallelogram about one of its sides, which line is called the axis of the cylinder. But in order to embrace all varieties of cylinders, we must generalise the mode of generation. A C., then, is a solid generated by a line which moves parallel to itself while one end traces upon a plane any curve whatever. When the position of the generating line is at right angles to the plane, the C. is *right;* when not, it is *oblique.* If the curve traced is a circle, and the line perpendicular to the plane, the C. is a *right circular C.*, &c. In all cases, the content of the C. is found by multiplying the number of square units in the base by the number of linear units in the altitude, which is the perpendicular distance between the two ends. The area of the convex surface is equal to a rectangular parallelogram whose base is the circumference of the end, and its height the length of the generating line. To this must be added the areas of the two ends, to get the whole surface of the cylinder.

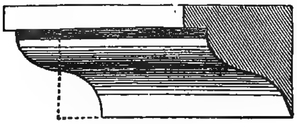


Right Circular Cylinder.

**CY'MA** (Lat.), in Architecture, a moulding consisting of a hollow and round conjoined. When hollow in the upper part, it is termed C. recta; when hollow in the lower part, it was called C. reversa.



Cyma Recta.



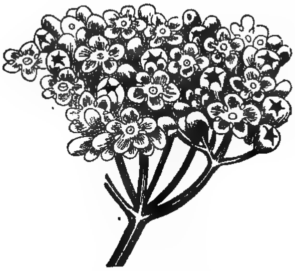
Cyma Reversa.

**CYMA'TIUM.** See Entablature.

**CY'MBALS** are military instruments of percussion, which, when struck one against the other, produce a loud harsh sound of no fixed pitch. The best C. are those made in Turkey and in China. Attempts to discover and imitate the composition of the metal have all failed. The notes in music for this instrument are all placed on the same line or space, in rhythmical succession. C., although military instruments, are now much used in the orchestra by modern composers.

**CY'MBEL,** an organ stop of the mixture species, consisting of three ranks of pipes. Also a stop found in very old continental organs, consisting of a machine like a star placed high up on the front of the organ, on which were hung small bells, which sounded when the star was moved round on its centre by a current of air from the organ.

**CY'ME,** in Botany, a common form of Centrifugal (q. v.) inflorescence, in which the rachis or floral axis disappears by separating into irregular branches, and these are short and corymbose. It is of very general occurrence in the *Caryophyllaceæ.* Examples may be seen also in the common elder, different species of *Viburnum*, &c. The *verticillasters* of the *Labiatæ* are small cymes in the axils of opposite leaves, assuming nearly the appearance of whorls.



Example of a Cyme.

**CY'MRY.** See Celtic Nations.

**CYNA'NCHÉ** (Gr. *kuōn*, a dog, and *anchō*, I suffocate), a term applied to the severer forms of sore throat. See Throat, Diseases of.

**CYNA'NCHUM,** a genus of plants of the natural order *Asclepiadaceæ*, having a wheel-shaped corolla, and a lobed or cleft corona. *C. Monspeliacum*—a herbaceous twining plant, with roundish, heart-shaped, stalked leaves, a native of the shores of the Mediterranean—yields the drug called *Montpellier Scammony*, a violent purgative, and not much used. *C. ovalifolium* is a native of Penang, and its sap yields caoutchouc of excellent quality.

**CYNAROCE'PHALÆ.** See Compositæ.

**CY'NICS,** the name applied to a sect of Greek philosophers, who were distinguished mainly for their morose and snarling ethics. For a knowledge of their peculiar opinions, see articles Antisthenes, Diogenes, Menippus, &c.

**CY'NIPS.** See Gall-fly.

**CY'NODON,** a genus of grasses, having digitate or racemose spikes, with spikelets on one side, glumes nearly equal, boat-shaped, and containing one floret, which has two awnless paleæ, the fruit coated with the hardened paleæ. The most important species is *C. dactylon*, a grass very widely diffused, being the principal fodder grass and best pasture grass of India, where it is the principal covering of many thousands of square miles, and is known by the names of *Dhob*, *Doorba*, &c., and also common in the south of Europe. In Britain, it is rare, being found only on the sandy shores of Cornwall. Its creeping roots, and those of its congener, *C. lineare*, have medicinal virtues, and are sometimes used as a substitute for sarsaparilla.

**CYNOMO'RIUM**, a genus of plants of the curious parasitic natural order *Rhizanthaceæ* (q. v.). *C. coccineum*, a plant of a strange fungus-like appearance, is found in the islands of Malta and Gozo, most abundantly on a particular rock in Gozo. It was long known as *Fungus Melitensis*, and enjoyed the highest reputation as a styptic, besides being used as an astringent in dysentery and other maladies. So high a value was set upon this plant, that the knights of Malta took it under their particular care as one of their choicest possessions; it was carefully gathered and deposited in a government office, from which the grand-master sent it to friendly sovereigns, and to the hospitals of the island. A keeper of the rock which produces the plant is still appointed, and his salary appears in the public accounts of Malta.

**CY'NOSURE** (Gr. *kynosoura*, the tail of the dog; *Ursa Minor*, the Little Bear) is the constellation of which the pole star is the principal star. Milton's lines—

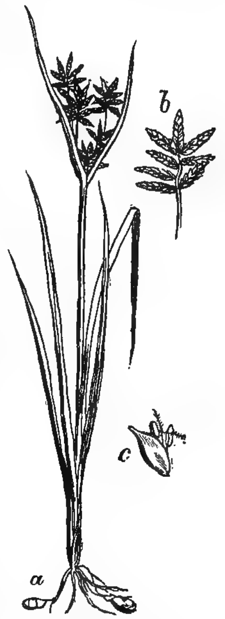
> Where perhaps some beauty lies,
> The Cynosure of neighbouring eyes.—*Allegro*.—

have made the word popular; the metaphor is grounded on *Ursa Minor* being the constellation towards which the others look, as it were, and round which they wheel.

**CYNOSU'RUS.** See Dog's-tail Grass.

**CYPERA'CEÆ**, or **CARICI'NEÆ**, sometimes popularly called Sedges, a natural order of plants, akin to Grasses, but having generally a triangular stem, which is without joints, or almost so, and often leafless. The leaves are sometimes sheathing, but their sheaths are always entire, not split, as in the grasses. The flowers, which are hermaphrodite in some, and unisexual in others, consist of a scale-like *glume*, under which lie the organs of fructification, the pistils alone being frequently enclosed in a separate urn-shaped covering; the place of the perianth is sometimes supplied by a few bristles. The stamens are 1—12 in number, the anthers erect: the ovary is one-seeded, the style single, trifid or bifid; the fruit a small crustaceous or bony nut, the embryo lenticular, and enclosed within the base of the albumen. Plants of this order, which contains fully 2000 known species, occur in all zones; some of the genera, as *Carex* (q. v.), abounding in the colder, some, as *Cyperus* (q. v.), in the warmer parts of the world. Many of them are plants of very humble growth, some, as Bulrushes, Papyrus, &c., comparatively large, but none rival in size the bamboos and other gigantic grasses. Most of them grow in marshy and moist places, but a few in sunny dry places. Their stems and leaves are in general very deficient in succulence, and in most of them, also very rough, so that they are eaten by domesticated cattle only when in a very young state, and rather from necessity than from choice, and are regarded by farmers as mere weeds. See Carex, Cyperus, and Scirpus. Some of the uses of plants of this order are noticed in the articles Bulrush, Cotton-grass, and Papyrus.

**CYPE'RUS**, a genus of plants of the natural order *Cyperaceæ*, distinguished by hermaphrodite flowers and compound spikelets of numerous two-rowed glumes including no bristles or scales. It contains a great number of species, chiefly tropical, and gradually decreasing in number towards the colder parts of the globe. Only two are found in England, and these are very rare. Many of the species have tubers or corms, which in some are mucilaginous and nutritious; in others, contain also a bitter principle, and possess medicinal qualities. Of the latter class is *C. longus*, or Sweet C., one of the species which have been found in England, common in ditches and wet meadows in some parts of Europe, the rhizome of which has an odour of violets, and is astringent, tonic, and stomachic. It has been employed in medicine from very ancient times; but is now more used in perfumery. Some of the Indian species are also used medicinally and in perfumery in their native country, as well as species of kindred genera. Of those with esculent tubers, the most important is *C. esculentus*, sometimes called Rush-nut, a native of the south of Europe and north of Africa, which is cultivated to a considerable extent in Egypt, Italy, Spain, Portugal, and the south of France. The root of this plant throws out creeping branches, at the end of which form farinaceous tubers of the size of a hazel-nut, which are called Earth Almonds (*Amande de terre*) by the French. They have a sweetish taste, and are used like almonds for the dessert, and also for making *Orgeat* (q. v.). They are said to possess not only nutritive, but restorative and stimulant properties. Of late, they have become a considerable article of commerce, upon account of the bland fixed oil which they yield, and are chiefly exported from Spain and Portugal to Holland. They contain about 16 per cent. of oil. The roots of this plant and its allies are the only roots known to contain much oil. The tubers of *C. bulbosus* or *Jemenicus* are eaten in India, either roasted or boiled, or are dried in the sun and made into bread; but their small size makes them troublesome of collection and preparation. Those of *C. geminatus* are also eaten. The tubers of some species of Scirpus (q. v.) resemble in quality those of the esculent species of cyperus. The fibre of *C. textilis* is so strong that it is employed in India for making mats.

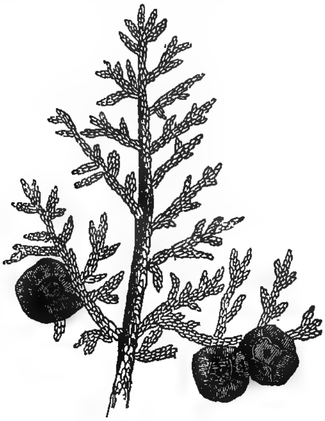


Cyperus Esculentus: *a*, whole plant; *b*, cluster of spikelets; *c*, a single flower.

**CYPRÆ'A.** See Cowry.

**CY PRÈS**, doctrine of, in English Law. As the law forbids the giving of an estate tail to the son of an unborn son of a living person, after a life-estate given to such unborn son, and would regard such estate tail as void, the courts, when such a gift is made in a will, apply the doctrine of C. P., and endeavour, *as near as possible*, to carry out the testator's wish, by giving to the unborn son of the living person an estate tail, instead of for life, and so enabling his son to succeed if the entail be not barred. See Estate Tail. So, also, when a charity cannot reasonably be administered precisely as directed by the testator, the court will, by the doctrine of C. P., administer it as near as possible to his directions.

**CY'PRESS** (*Cupressus*), a genus of plants of the order *Coniferæ*, the species of which are evergreen trees or shrubs, with small generally appressed and imbricated leaves, and with almost globular cones, the scales of which bear numerous hard seeds. The best known species is the COMMON C. (*C. sempervirens*), a native of the Levant, the north of Africa, and the south of Europe, and sometimes met with in England. It is a tree of no great height, with quadrangular twigs. The leaves are dark-green, and the tree has, therefore, a sombre aspect, and from very early times has been an emblem of mourning; the Greeks and Romans put its twigs in the coffins of the dead, they used it to indicate the house of mourning, and planted it about burial-grounds, as is still the custom in the East. The wood of the C. is yellow or reddish, and has a pleasant smell. It is very hard, compact, and durable; the ancients reckoned it indestructible; and the resin which it contains gives it the property of resisting for a long time the action of water. It is not liable to the attacks of insects, and was formerly much esteemed for the purposes of the cabinet-maker. Some believe that the C. is the true cedar-wood of Scripture, and it has also been supposed that it is *Gopher wood.* Specimens of this wood are in existence in museums, which are known to be several thousands of years old. The doors of St Peter's at Rome, made of C., lasted from the time of Constantine the Great to that of Pope Eugene IV., above 1100 years, and were perfectly sound when at last removed, that brazen ones might be substituted. Medicinal virtues were formerly ascribed both to the wood and seeds of the C., and the balsamic exhalations of the tree were reckoned very salutary in diseases of the chest.—Several other species of C. are natives of temperate and warm climates in different parts of the world. There are many species, the principal of which are the Portugal C. or Cedar of Goa (*C. Lusitanica*), a native of Goa naturalised in Portugal; *C. thurifera*, a native of Mexico, which exudes a resin used in that country for incense; *C. torulosa*, a native of the Himalaya, and which has been grown successfully in Britain; *C. funebris*, lately introduced into Britain from China; the White C. or White Cedar of North America (*C. thyoides*). The Deciduous C. or Virginian C. (*Taxodium distichum*, or *Schubertia disticha*) is now regarded as belonging to a different genus, and attaining a height of 120 feet, and found in the cypress swamps of Delaware and elsewhere.



Branch and Fruit of Cypress (*Cupressus sempervirens*).

**CY'PRIAN**, THASCIUS CÆCILIUS, an illustrious father of the African Church, was born in Carthage about the beginning of the 3d century. He belonged to a respectable family, and was a distinguished teacher of rhetoric before his conversion to Christianity, which took place 246 A. D. His benevolence secured for him a high degree of popularity, and his piety no less veneration, in consequence of which he was made bishop of his native city in less than three years. In 250, he fled into the desert, to avoid the persecution of Decius. Here he remained a whole year, but not in idleness. The same prudence, energy, and activity that he had always displayed, were now shewn in that extensive correspondence which he carried on with his clergy on ecclesiastical matters. On his return to Carthage in 251, he suppressed, but with moderation, the rising controversy regarding the *Lapsed* (q. v.), or Christians who, during the time of trial, had apostatised. C.'s views regarding the proper dignity of the Bishop of Rome have frequently been mistaken: he, indeed, recognised the Roman bishop as the successor of Peter, and as the representative of the unity of the church; but he asserted that the pre-eminence of the Roman see was confined to the earliest times, and that, in later times, other bishops, or successors of the apostles, had dignities equal to that of the successors of Peter. He therefore firmly opposed the supremacy asserted by the Roman bishop, Stephanus, in the question of baptism by heretics. In the persecution under Valerian, 257, C. was banished to Curubis; but having returned to Carthage in the following year, he was there beheaded. C. was both a learned and eloquent divine, but he was even more conspicuous for his dignified, moderate, and wise conduct. His knowledge of human nature enabled him to exercise a wide influence over the African Church; and his correspondence, from which the best idea of his character is obtained, gives us an interesting picture of the times in which he lived. His writings—less crabbed and rhetorical than those of his teacher, Tertullian—contain, besides 81 *Epistolæ*, or official letters, several important treatises, among which may be mentioned the *De Unitate Ecclesiæ Catholicæ*, the *De Lapsis*, the *De Disciplina et Habitu Virginum*, the *De Gratia Dei*, and the *De Idolorum Vanitate.* The best editions of C.'s complete works are that of Fell, Bishop of Oxford (1682), and that of Baluzzi (Paris, 1726). C.'s life was written by his friend Pontius.

**CYPRI'NIDÆ**, a family of malacopterous fishes, having a small mouth, the jaws almost toothless, but the pharynx or hinder part of the mouth furnished with teeth; the body generally covered with scales, the gill-rays few, and no adipose fin (like the second dorsal fin of the trout or salmon). The genera and species are numerous. All the C. are fresh-water fishes. They are found in the lakes and rivers of almost all parts of the world. To this order belong the Carp (*Cyprinus*), Tench, Bleak, Bream, Barbel, Minnow, Gold Fish, Roach, Loach, &c. Many of the species are much esteemed for the table. The fecundity of the C. is great.

**CYPRINODO'NTIDÆ**, a family of malacopterous fishes, allied to *Cyprinidæ*, with which they were formerly ranked, but differing from them in having the jaws more protractile and toothed. Some of them are American, some Asiatic; some inhabit fresh, and some salt water. To this order belong some interesting and curious fishes, particularly the Anableps (q. v.), remarkable for the conformation of its eyes. The species of the genus *Orestias* are found in the lakes of the Andes, at a great elevation above the sea, and are highly esteemed for the table.

**CY'PRIS**, a genus of minute entomostracous crustaceans of the order *Branchiopoda* (q. v.), having the body enclosed in a shell of two horny pieces, somewhat resembling that of a bivalve mollusc. The antennæ and feet are beautifully feathered with long fringed bristles, by means of which these animals swim with much vivacity. They abound in every pool of stagnant water. Their horny shells are very abundant in a fossil state in the Wealden rocks of England, in the limestone of the carboniferous series, &c.

**CY'PRUS** (Anc. Gr. *Kupros*, Mod. Gr. *Kibris*, Fr. *Chipre*, Ital. *Cipro*), an island situated south of Asia Minor, in that portion of the Mediterranean called the Levant. C. was anciently divided into many small kingdoms. It was originally possessed by the Phœnicians, from whom it passed to the Greeks, and subsequently to the Egyptians and Persians. After the victories of Alexander, it declared for Macedon. It next became a portion of the Græco-Egyptian kingdom of the Ptolemies, then of the Roman and Byzantine empires. The Arabs conquered it 648 A. D.; in 1191, it was taken by Richard Cœur-de-Lion, who ceded it to the Templars. After several vicissitudes, it came into the possession of the Venetians, from whom it was finally conquered by the Turks in 1571.

C. lies in lat. 35° N., long. 32° 20′—34° 40′ E., its greatest length from Baffa, in the south-west, to Cape Andrea, in the north-east, being about 140 miles; and its greatest breadth, between Cape Gatto and Cape Kormachiti, about 60. The total area is 1000 square leagues; and its population in 1858, 180,000. A range of mountains—the Stavro Vuno and Santa Croce (ancient *Olympus*)—the sides of which are very bold and rugged, runs through the whole length of the island, attaining an elevation of more than 7000 feet above the sea. Three-fifths of the island is mountainous. Of these one-fifth has splendid forests of oak interspersed with walnut-trees, and would furnish large supplies of sulphur, pit-coal, and metals of various kinds, under intelligent management; while two-fifths is adapted for vine and olive culture, and the growth of fruit-trees generally. 'The remaining two-fifths is composed of magnificent plains, and extensive open country, which, though wanting in rivers and streams, are still very productive in cereals.' The soil is exceedingly fertile, yielding all kinds of grain, together with tobacco, flax, cotton, madder, sesame, &c.; other products are wool, cotton, and silk. Of the latter, two crops are obtained in the year. C. has also two valuable salt-pits. Its great want is water. The few springs dry up in the summer, and not a drop of rain falls during seven months in the year. The climate is on the whole very healthy; the diseases, 'both with regard to their frequency and their character, do not relatively reach three-fifths of the amount of disease in Europe, or even in Italy.' Agriculture and manufactures are alike in a backward state; the Greek Christians, who compose the bulk of the population, being indolent and spiritless, through fear of the dominant Turks, who are ignorant and fanatical. The former, however, have an unenviable reputation for double-dealing. The revenue amounts to 14,000,000 piastres (£116,666), while the total disbursements for government, &c., amount only to 1,000,000 piastres (£8333), so that the possession of C. is a clear annual gain of £108,000 to the sultan. The shipping of the island is trifling, comprising only from 5 to 10 vessels, of 50 to 100 tons, and from 30 to 80 smaller boats. The imports in 1858 amounted to £57,939, and the exports to £131,110. The chief towns of C. are Nicosia, the capital and seat of the Turkish government; Famagosta, Larnica, the residence of the European consuls; and Limassol.—*Report of British Consul*, 1858.

**CY'PSELUS.** See SWIFT.

**CYR, ST**, the name of several places in France, the most important of which is St C., in the department of Seine-et-Oise, about 3 miles west of Versailles. Pop. 1000. The village owes its origin to an educational institution for the daughters of nobles of fourth descent on the father's side, founded here in 1686 by Louis XIV., on the suggestion of Madame de Maintenon. There were about 250 pupils, for whom Racine wrote his tragedies of *Esther* and *Athalie*. Madame de Maintenon died here, and was buried in the choir of the church. The institution was suppressed at the Revolution. The buildings were at first converted into a military hospital, and in 1803 into a military school by Napoleon for the education of some 300 officers, about 140 of whom leave annually.

**CYRENA'IC SCHOOL.** See ARISTIPPUS.

**CYRENA'ICA**, the name of the district whose capital was Cyrene (q. v.). At one period, it nominally stretched from Carthage to Egypt, and extended inland as far south as the oasis of Fezzan; but a great portion of this territory was occupied by the subject Libyan tribes, and not by the Greek colonists, who were confined chiefly to the plateau of Barca, with the subjacent coast. This portion of C. was, and still is one of the loveliest and most agreeable regions of the world. The climate is delicious, mountains on the south sheltering the land from the scorching blasts of the Sahara, and cool sea-winds fanning it on the north. From the central plateau, whose breadth is about 80 miles, the land slopes down in verdant terraces to the Mediterranean. These terraces are cut and watered by mountain streams, forming luxuriant ravines. The productions of C. mentioned by ancient writers are corn, oil, wine, honey, fruits of all kinds, cucumbers, truffles, cabbage; flowers yielding the richest perfumes; and a rare plant called *silphium* (still abundant), from which was obtained the gum-resin, greatly esteemed for medicinal purposes. The country was also celebrated for its breed of horses, but was much exposed to the ravages of locusts.

The chief cities of C. were Cyrene, Teucheira (afterwards called Arsinoë), Hesperides (afterwards called Berenice), Barca, and Apollonia. To each of these five cities (whence in the time of the Ptolemies C. was named Pentapolis and Pentapolitana Regia), a certain amount of territory was attached. This favoured their individual independence; and the consequence was that the dynasty of Battus, who led the first Greek colony to Cyrene (q. v.), exercised very little influence over C. in general. After passing into the hands of the Egyptians and Romans, C. became a portion of the Byzantine empire. In 616 A. D., it was conquered by the Persian Chosroes, and in 647 was overrun by the Arabs. Ancient C. nearly corresponds with modern Barca (q. v.).

**CYRE'NÉ**, the capital of Cyrenaica (q. v.), was founded, 631 B. C., by a colony of Spartans under Battus, whose dynasty lasted for nearly two centuries. During this period, it made rapid advances. On the death of Arcesilaus IV., the last of the Battidæ, about 450 B. C., a republic was established, but the political condition of the city under the new government was far from prosperous. Party contests raged, until at last it fell into the hands of the Romans. During its prosperity, C. carried on a great commerce with Greece and Egypt, and to a less extent with Carthage. Its extensive ruins still attest its former magnificence. C. was the birthplace of the philosophers Aristippus, Anniceris, and Carneades, the poet Callimachus, the astronomer Eratosthenes, and the rhetorician Synesius, who afterwards became Bishop of Apollonia.

**CYRIL, St**, Bishop of Alexandria, was one of the most energetic, but least amiable of the Church Fathers. The date of his birth is not known. He was educated by the fanatical monks of Nitria, with whom he lived for five years, and who probably inspired him with that fiery, intolerant, and ignorant zeal which characterised him through life. Subsequently, he went to Alexandria, where he became a presbyter, and on the death of his uncle, Theophilus, 412 A. D., obtained the episcopal see. He had now full scope to exhibit his arrogance, vindictive jealousy, and priestly zeal. The Alexandrian Jews, who were numerous and wealthy, were the first to feel the fierceness of his pious wrath. Some Christian blood having been shed by them in a city tumult, C. put himself at the head of a rabble of zealots, attacked the Jewish quarter of Alexandria, destroyed the houses, and banished the inhabitants. Orestes, the prefect of Egypt, having drawn up an accusation against C., was attacked in the streets by 500 monks, who had come up from the deserts of Nitria, at the call of their old companion, eager for the work of destruction. One of these monks having fallen in the skirmish, his corpse was carried in procession to the High Church of Alexandria, where C. delivered a sanguinary discourse, gave the dead monk the name of *Thaumasius*, and pronounced him a martyr and a saint. But perhaps the most barbarous deed with which this persecutor of heretics and heathens had to do, was the murder of the heathen maiden Hypatia (q. v.), the daughter of the mathematician Theon. Theodoret gravely accuses him of instigating the Alexandrian populace to this horrid act; and unfortunately there is nothing in C.'s character to make us doubt the truth of the accusation. But the most important historic event in his career, was his controversy with Nestorius (q. v.). All the worst features of his disposition appeared in this broil. In the midst of unquietudes, which he himself had largely occasioned, he died 444 A. D. C.'s numerous writings consist of commentaries, treatises, homilies, epistles, &c. The best edition was published by Aubert (7 vols., Paris, 1638).

**CY'RIL, St**, Bishop of Jerusalem, an eminent Church Father, was born at Jerusalem about 315 A. D., and ordained a deacon in 334, a presbyter in 345, and on the death of Maximus in 351, was elected bishop of his native city. His metropolitan was the Arian bishop, Acacius of Cæsarea, with whom he was soon engaged in hot conflict concerning originally the rights of his office, but ultimately their differences of doctrine. Acacius accused C., before a council hastily 'got up' at Cæsarea in 358, of selling the treasures of his church in a time of famine to feed the poor! Strange to say, C. was deposed for doing this praiseworthy action. He now appealed to a larger synod, which was held at Seleuceia. This synod restored him to his office; but once more, through the persevering hostility of Acacius, he was deposed by a council assembled at Constantinople in 360. On the death of the Emperor Constantius, he was again restored to his episcopate in 362. Soon after, his old enemy Acacius died, but C. was immediately involved in new difficulties. After considerable strife, C. was banished, by order of the Emperor Valens, in 367; nor did he return till the emperor's death in 378. He died in 386.

C.'s writings are extremely valuable, not on account of their vigour, profundity, or beauty, but on account of their theology. They consist of 23 treatises, 18 of which are addressed to catechumens, and 5 to the newly baptised. The former are for the most part *doctrinal*, and present to us in a more complete and systematic manner than the writings of any other Father the creed of the church; the latter are *ritual*, and give us a minute account of baptism, chrism, and the Lord's Supper. Their style is simple and unattractive. The best edition of C.'s works is that published by Touttée, the Benedictine monk (Par. 1720).

**CYRIL**, the apostle of the Slaves (in the 9th c.), sprang from a respectable family living in the half-Slavic, half-Greek town of Thessalonica. On account of his knowledge, he obtained the surname of the Philosopher. Having been consecrated a priest, he went forth, during the reign of the Byzantine emperor, Michael III., to evangelise the Chasars, who dwelt by the Caspian Sea. His labours were very successful, the khan himself being among his converts. Boris, the heathen prince of Bulgaria, having about this time besought the patriarch of Constantinople to send him a preacher of the gospel, C., along with his brother Method, were selected. Their labours were not in vain. Boris was baptised in 860. Rastic, prince of Moravia, next invited them to his country. They accepted the invitation, and while there, assisted by a number of their own pupils, completed their translation of the Holy Scriptures, which is in use to the present day, as a sacred or church language, among all Greek-Catholic Christians (Russians, Bulgarians, and Serbs). From Moravia, Christianity, according to the Slavic ritual, spread into Bohemia, whose prince, Boriwoj, and his spouse, Ludmilla, were baptised by Cyril. C. died in 869. The *Apologi Morales*, ascribed to C., were published by Corter (Vienna, 1630). See Richter's *Cyril and Method* (Olmütz, 1825).

**CY'RUS**, the founder of the Persian monarchy, commonly called C. THE ELDER, was, according to Herodotus, the son of Cambyses, a Persian noble, and of Mandane, daughter of Astyages, the Medo-Persian king. His birth was a source of alarm to his grandfather Astyages, who had previously had a dream, the interpretation of which portended that the offspring of Mandane would one day be the ruin of the Median supremacy and the ruler of all Asia. He therefore contrived to get the infant into his own hands, and gave it to Harpagus, his chief servant, with orders to put it to death. Harpagus promised to do so, but intrusted it privily to the care of a herdsman, who brought it up along with his own children. The young C. quickly distinguished himself among the country lads by his superior daring and dignity. On one occasion, he was elected king in some boyish game by his companions, and in the exercise of his regal authority, caused a nobleman's son to be severely scourged. The father complained to Astyages, who caused the culprit to be brought before him, and recognising in his person and mien his own grandson, sent C. back to Persia—the Magi having in some way satisfied him that his dream had already received its fulfilment. C. himself, however, did not think so, and as he grew up to manhood, began to meditate ambitious schemes. All writers testify to his courage, amiability, and address. He was exactly the kind of man to gather round him brave, venturesome, loyal followers. The tyranny of Astyages had made him hateful to his subjects, and by the help of the crafty Harpagus, C. soon formed a party among the Medes favourable to his designs. Putting himself at the head of his Persian troops, C. advanced into Media, and overthrew the forces of Astyages (559 B. C.). After consolidating his new dominions, which seems to have cost him many years' labour, he proceeded in his career of conquest. The kingdom of Lydia first yielded (546 B. C.), and its king, the famous Crœsus, fell into his hands. Ultimately, the whole of Asia Minor was subdued. But the crowning triumph of C. was his capture of the city of Babylon, the metropolis of Assyria (538 B. C.), whose king was Labynetus, the Belshazzar of Daniel. Through the instrumentality of C., the Jews were delivered from their captivity, and allowed to return to Palestine. His vast ambition, however, proved his ruin. He wished his power to overshadow all Asia, in harmony with the dream of his grandfather; and although his dominions already extended from the Hellespont almost to the Indus, he resolved to subjugate the Scythian peoples, and began an unjust war with the Massagetæ, a nation or tribe who dwelt to the north-east of the Caspian, beyond the Araxes, whose queen was called Tomyris. At first C. was successful, but in a second engagement he was defeated and slain (529 B. C.).

Such is the account given by Herodotus, and although we are unable to affirm that it rests on absolutely historical ground, it is unquestionably to be preferred to any other. The work of Xenophon, entitled the *Cyropædeia*, is not a history; it is a historical romance, and was manifestly intended by the author for such. Xenophon wished to picture a great and wise king, and finding the elements both of greatness and wisdom in C., he took advantage of his historic personality, and engrafted upon it whatever, according to his own notion, would ennoble and dignify it.

**CYRUS, THE YOUNGER**, the second of the sons of Darius Nothus, or Ochus, lived about 130 years after the great Cyrus. He conspired against his brother Artaxerxes Mnemon, who had succeeded to the throne (404 B. C.). The plot, however, being discovered, he was at first sentenced to death, but afterwards pardoned, and even restored to his dignity as satrap of Asia Minor. Here he employed himself in making arrangements for war against his brother, although he concealed his purposes to the very last. In the spring of 401 B. C., he left Sardis at the head of 100,000 Asiatics, and 13,000 Greek mercenaries, under pretence of chastising the robbers of Pisidia. Artaxerxes being warned of C.'s perfidy, made preparations to oppose him, and the two armies encountered each other in the plains of Cunaxa, 500 stadia from Babylon. C. was defeated and slain, although the Greeks fought with the greatest courage, and even routed that portion of Artaxerxes' troops immediately opposed to them. The fortunes of the Greeks, on their retreat through the highlands of Armenia, in severe winter-weather, are recorded by Xenophon in his *Anabasis* (q. v.).

**CYST** (*kystis*, a bladder), a word sometimes used in the original sense as applied to hollow organs with thin walls, as the urinary bladder and gall bladder; but commonly reserved for the designation of pathological structures or new formations within the body, having the bladder form. Cysts are commonly transparent, and often almost structureless in their tenuity; they are commonly, however, lined by an Epithelium (q. v.), and have membranous walls, with faint indications of fibrous structure. They are either simple or compound, unilocular or multilocular; they are sometimes small, numerous, and separate; in other cases, they grow to an enormous size, and are very complex. Some cysts are distinctly parasitic, and of independent animal nature; such are Hydatids (q. v.) and the cystic Entozoa (q. v.) generally. Others are probably formed out of the structures in which they arise, their true pathology being, however, obscure. Such are the cysts of the kidney, and still more distinctly, the immense complex cystic structures which form in the ovary. See OVARY, DISEASES OF.

**CYSTIC WORMS**, an order of *Entozoa*, or Intestinal Worms, according to the system of Zeder and Rudolphi, for some time generally received by naturalists, characterised by the body ending in a transparent cyst or bladder filled with pellucid fluid, this body having sometimes only one head, as in *Cysticercus*, sometimes many, as in *Cœnurus*. It has, however, been found that certain species, as *Cysticercus cellulosæ* and *Cœnurus cerebralis*, are the young of cestoid worms, and it is therefore concluded as highly probable, that all the C. W. are of the same nature, more particularly as all present the appearance of immaturity, in the want of visible organs of reproduction. Until a comparatively recent date, the animal nature of C. W. was not recognised, nor is it long since their relation to tape-worms and other cestoid worms has been fully ascertained. See CESTOID WORMS, CYSTICERCUS, ECHINOCOCCUS, STAGGERS, and TAPE-WORM.

**CYSTICE'RCUS** (Gr. bladder-tail), according to many naturalists, a genus of Cystic Worms (q. v.), characterised by a dilated cyst with a single head, which has four suckers and a circlet of hooks. This genus has, however, recently been displaced from the system of nature by the discovery that the forms referred to it are only the young of tape-worms. This discovery has been confirmed by a multitude of observations and experiments with regard particularly to *C. cellulosæ*, found in human beings, and in many rodent and pachydermatous animals—as rabbits, pigs, &c.—the young of the common tape-worm; and *C. tenuicollis*, found more rarely in human beings, but often in the abdominal cavity of ruminant quadrupeds, and of pigs, horses, and many other animals—the young of a tape-worm of the dog. *C. cellulosæ* often exists in great numbers in the flesh of pigs, causing the diseased appearance known as *measly*. See CESTOID WORMS, where it is figured. It sometimes occurs in like manner infesting the human body, in muscles of most various parts; it has been found even in the heart, in the brain, and in the eye. That in such cases it sometimes causes death, is too certain, and its removal is not easy, except when it is so situated that it can be reached by the knife, nor is there any sure indication by which its presence in many situations can be known; but it appears also that it may die and be absorbed without causing any very serious consequences to the person in whom it has dwelt. The cysts of this species are always of small size; those of *C. tenuicollis*, however, which generally occurs in the liver, or in other abdominal organs, sometimes become, in some of the lower animals, as large as a child's head. Injurious consequences are produced by them when either numerous or very large.

**CY'STIN, or CY'STIC OXIDE**, forms a rare variety of Calculus (q. v.). It contains $C_6H_6NO_4S_2$, has a crystalline texture, a brownish-yellow colour, and is semi-transparent. It is not soluble in water, alcohol, or ether, but dissolves in the strong acids.

**CYSTI'TIS.** Inflammation of the urinary bladder (q. v.).

**CY'TISUS**, a genus of plants of the natural order *Leguminosæ*, sub-order *Papilionaceæ*, of which some of the species, having long twiggy branches, are popularly called BROOM (q. v.), others are called Laburnum (q. v.), whilst others still are generally known by the name Cytisus. The characters of the genus are stated in the article BROOM. The species are numerous—small trees or shrubs, with leaves of three leaflets, and yellow, white, or purple flowers, natives chiefly of the warmer temperate parts of the Old World. Many of them are very beautiful, and some are among the esteemed ornaments of our shrubberies, others of our green-houses.

**CY'TOBLAST.** See Cells.

**CY'ZICUS**, a peninsula of Anatolia, Asia Minor, projecting into the Sea of Marmora. It lies to the south-east of the island of Marmora, and about 70 miles south-west of Constantinople. It was at one time an island, but the gradual formation of an isthmus connected it with the mainland. Its length from south to north is about nine miles, and its breadth from east to west 18 miles. In early times, C. was a Milesian colony, and the city of C., upon whose site vineyards and orchards now flourish, is described by Strabo as one of the first cities in Asia, alike for extent and splendour.

**CZACKI**, Tadeusz, an eminent Polish author, was born in 1765 at Poryck, in Volhynia. At the age of twenty, he obtained an office in the supreme justiciary court at Warsaw, and was also made director of the crown archives—a situation which enabled him to gratify his taste for Polish history. Some essays on Polish finance induced the diet to select him, in 1788, as a member of the commission of inquiry into the state of the revenue. His efforts to animate the industry and extend the commerce of his native country were most praiseworthy. A valuable result of his travels through Poland for this purpose is a map of its river-system. He also interested himself greatly in the navigation of the Dniester. At the second partition of Poland, he lost his property, but it was afterwards restored. The chief labour of his life, however, was in connection with the education of his countrymen. His endeavours to instruct the people in the old Polish provinces of Russia, where education had been almost wholly neglected, met the approval of the Emperor Alexander. The most important of C.'s educational institutions was the gymnasium at Krzemieniec. In 1807, he was appointed the deputy of Prince Czartoryski, who had the care of public instruction in the Polish government of West Russia. C. died at Dubno, 8th February 1813. His writings prove the comprehensive character of his attainments. His most valuable work is upon Lithuanian Law (*O Litewskich i Polskich Prawach*, 2 vols., War. 1800).

**CZAR**, more properly *Zar*, is a title of the Russian emperor. The word is derived from the old Slavonic language, and signifies much the same as Ger. *Kaiser*, Lat. *Cæsar*, to which it probably owes its origin; although some etymologists identify it with the termination of the names of the old Assyrian kings—such as Phalassar, Nabonassar, and Nabopolassar. After the 12th c., we find the Russian annalists giving the title of C. to the Grand Duke Wladimir, Monomach (died 1125), and to several of his successors. In general, however, the rulers of the various Russian provinces were called Grand Dukes till the 16th century. Thus, we have the Grand Dukes of Wladimir, Kiew, Moscow, &c. The Grand Duke Wassilij Iwanowitch first assumed, in the year 1505, the title of *Samodershez*, which signifies autocrat. The son of Wassilij, Iwan II., Wassiljewitch the Cruel, caused himself to be solemnly crowned C., 16th January 1547. From this time, the Russian monarchs called themselves Czars of Moscow; and after the conquest of Little Russia and Smolensk, Czars of All the Russias. The word now became practically the equivalent of Emperor; yet Peter I., in 1724, thought fit to assume this latter title in addition; and as the Russian language had no term corresponding to it besides C., the Latin word *Imperator* was introduced, while the empress was termed *Imperatriza.* At first, several European powers refused to sanction the assumption of imperial dignity by the Russian C., but ultimately consented to do so. The wife of the C. was named Czariza (Czarina); the sons, Czarewitch; the daughters, Czarewna; but after the death of Alexei—Peter I.'s son—these titles were abolished, and the imperial princes were called Grand Dukes, and the imperial princesses Grand Duchesses. In 1799, the Emperor Paul I. introduced the title of Cesarewitch (not Czarewitch) for his second son, the Grand Duke Constantine. In the same way, the Grand Duchess now bears the title of Cesarewna. Among the Russian people themselves, the emperor is more frequently called Gossudar (Hospodar, i. e.; Lord) than Czar.

**CZARTORY'SKI**, Adam George, son of Prince Adam Casimir C., descended from Olgerd, the founder of the Jagellonian dynasty of Poland, was born at Warsaw, 14th January 1770. Having completed an excellent education at Edinburgh and London, he returned to his native country, and took part against Russia in the war occurring on the second partition of Poland. On the defeat of the Poles, C. was taken to St Petersburg as a hostage, and here he exhibited so much ability and prudence as to gain the friendship of the Grand Duke Alexander, to whom he was attached, and the confidence of the Emperor Paul, who made him ambassador to Sardinia. When Alexander ascended the throne, he appointed C. assistant to the Minister of Foreign Affairs; and he took an active part in official life until after the peace of Tilsit. As curator of the university of Wilna, to which he was nominated in 1803 by Russia, he exerted all his influence to keep alive a spirit of nationality; and when some of the students were arrested on a charge of sedition, and sent to Siberia, C. resigned his office. His successor reported to the emperor, that the amalgamation of Russia and Lithuania had been delayed a century by C.'s occupancy of the curatorship. Russian favours could not deaden or even dull C.'s pure patriotism. Into the revolution of 1830 he threw himself with all his heart. He was elected president of a provisional government, and in this capacity summoned a national diet, which met, and in January 1831, declared the Polish throne vacant, and elected C. head of the national government. He immediately devoted half of his large estates to the public service, and adopted energetic measures to meet the power of Russia, but in vain; the Poles were crushed, and C.—specially excluded from the general amnesty, and his estates in Poland confiscated—escaped to Paris, where he has since resided, the liberal friend of his poor expatriated countrymen, and the centre of their hope of a revived nationality. In 1848, he liberated all his serfs in Galicia, and during the Crimean war he ineffectually endeavoured to induce the Allies to identify the cause of Poland with that of Turkey.

**CZA'SLAU**, a town of Bohemia, 45 miles east-south-east of Prague. Its deanery-church, in which the celebrated blind Hussite leader, General Ziska, was buried, is surmounted by the highest steeple in Bohemia. C. is also noted as the scene of an important victory gained over the Austrians by Frederick the Great, 17th May 1742. Pop. 4000, who are chiefly engaged in agriculture and the manufacture of saltpetre.

**CZECHES**, the most westerly branch of the great Slavic family of nations. About 451—495 A.D., the C. migrated from their lands in Carpathia, on the

Upper Vistula, and came into the country now known as Bohemia. According to tradition, their chieftain was named Czech. Georgsberg, near Raudnitz, on the Elbe, is said to have been the first place chosen by the C. for their encampment. Other Slavic tribes migrated into Bohemia; but in the course of time the C. gained such an ascendency that, in the 9th c., the name C. was commonly applied to the whole Slavic population of Bohemia (q. v.).

**CZE'GLED**, a market-town of Hungary, situated on a plain between the Danube and the Theiss, 40 miles south-east of Pesth. It has some handsome buildings and large breweries. The inhabitants, 18,000 in number, are employed principally in agricultural pursuits, the district around yielding much grain and red wine.

**CZENSTOCHAU**, or **CZENSTOCHOWA**, a monastery of the order of St Paul the Hermit, in the Polish government of Kalisch. It is the most frequented place of pilgrimage in the whole country, and is celebrated throughout all the Slavic nations. It occupies a commanding position on the Warthe, not far from the Silesian frontier, and possesses the famous dark-coloured picture of the mother of Christ, which has given occasion to the worship of the Black Virgin by all the Polish Catholics. This picture is probably of Byzantine origin. According to the legend in connection with it, it was painted by Luke himself; passed into the hands of the Princess Helena; subsequently found its way through a Russian prince, Laon, to Belz in Galicia; and finally, through Wadyslaw, Duke of Oppeln, who built the monastery of C., was brought thither to assist him against the Tartars. In more recent times, C. is noted as being the only place in Poland which offered resistance to the army of Charles Gustavus, king of Sweden, on which occasion (1655 A. D.) the inmates, comprising 70 monks and 150 soldiers, withstood a siege of 38 days carried on by a Swedish force of 10,000 men. At a later period, however, C. lost its importance as a military position. At the foot of the eminence on which the monastery stands, lie two little towns, Old and New C., which carry on a considerable trade in holy pictures and amulets.

**CZE'RNOWITZ**, a town of the Austrian Bukowina, situated on a hill near the right bank of the Pruth, about 140 miles south-east of Lemberg, in lat. 45° 26′ N., long. 25° 59′ E. It has a Greek cathedral, and manufactures of clocks, silver articles, and hardwares. Pop. 1851, 20,500.

**CZE'RNY**, GEORG, properly, *Karadjordje*, i. e., Black George, the leader of the Servians in their struggles for independence, was born in 1770 in the neighbourhood of Belgrade. He shewed, when young, his hatred of the oppressors of his country by murdering a Moslem. After spending some time in Austria, he returned to his paternal estate. In August 1801, a band of janizaries broke into his dwelling, and plundered it. C. fled, vowing vengeance. He soon collected a band of malcontents, and commenced a sort of guerilla war. Gradually his numbers increased, and in 1804 he captured the fortress of Schabaz. Subsequently, he invested Belgrade, and in the beginning of 1806 routed the Turks at the rivers Drina and Morawa. Assisted secretly by Russia, he captured Belgrade in December 1806. After the treaty of Slobosje (8th July 1808), he was elected governor by the people, and recognised as Prince of Servia by the sultan. The French invasion of Russia in 1812 compelled the latter country to let Servia shift for itself. Hostilities recommenced; the Turks were successful, and C. had to flee to Russia. He afterwards went to Austria, where he lived for some time. Meanwhile, the freedom of Servia had been secured through the leadership of Milosch Obrenowicz; and in July 1817, C. returned, intending, as some suppose, to rally his partisans round him for the furtherance of his ambitious schemes, when he was murdered at the instigation of Prince Milosch.

# D

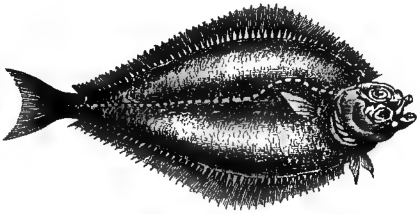
D THE fourth letter in the Greco-Roman alphabets, was called in the Semitic languages *daleth* (hence Gr. *delta*), i.e., 'door;' and in all probability its original hieroglyphic or picture form was a door. The Greek Δ, in fact, yet preserves a recognisable resemblance to the door or opening of a tent, the kind of door most familiar to a nomadic people. D belongs to the order of letters called *dentals* (see Letters, Alphabet), *t*, *d*, *th* (in *th*in), *th* (in *th*ine), and in the corresponding words of sister-languages is often exchanged with those of the same order or organ; thus: Ger. *du*, Eng. *thou;* Ger. *tod*, Eng. *death;* Lat. *duc-*, Eng. *tug;* Lat. *duo*, Eng. *two*. A more remarkable interchange is that between *d* and *l*, and *d* and *r*. See L and R. D seems to have been drawn into some words (to which it does not radically belong) by a kind of affinity for *n*, as Lat. *canis*, Gr. *kyon*, Eng. *hound;* Lat. *gener-*, Eng. *gender*. *Di* followed by a vowel is sometimes transformed into J; as in *Janus* for *Dianus; Journal* from *diurnal*. *Di* followed by a vowel in Latin, has, in Italian, become *z*; and from MSS. and other evidence, we know that this sibilant sound of *di* prevailed, in the popular pronunciation at least, while Latin was yet a living tongue. Thus, *diabolus* is found written *zabolus*, and *Amazones*, *Amadiones*.—D, the Roman numeral for 500, arose out of the character IↃ. See Numerals.

D, in Music, is the second note in the natural scale, and is a whole tone above C, to which it stands in mathematical proportion as 9 : 8, that is, when C vibrates eight times, D vibrates nine times. The whole tone from C to D is called the greater whole tone, being a comma larger than the next whole tone from D to E.

**DA CA'PO** (Ital., from the beginning), a term in Music, frequently placed at the end of a part or movement, indicating that the performer must return to the beginning of the movement, or to some other part of it usually marked with the sign 𝄋, and finish where the word *fine* is placed. Scarlatti was the first who introduced the use of the *da capo* in his opera of *Theodora*. The words are generally abbreviated thus, D. C., sometimes *D. C. al fine*.

**DA VI'NCI**, Leonardo. See Leonardo da Vinci.

**DAB** (*Platessa limanda*), a fish of the same genus with the plaice and flounder, and very much resembling them, but easily distinguished from either of them by its more uniform and lighter-brown colour, the roughness of its scaly surface, and its more curved lateral line, which rises into a high arch over the pectoral fin. It is common on all sandy parts of the British coasts, inhabits deeper water than the flounder, and does not, like it, enter the mouths of streams. It is known on the coasts of the Firth of Forth as the Salt-water Fluke. It is preferred to the flounder for the table. It seldom exceeds 12 inches in length. A rather larger species of the same genus, less plentiful on the British coasts, is the Lemon D. or Smooth D. (*P. microcephala*). Its body is smooth, its colour a pretty mixture of various shades of reddish-brown and yellow: its head and mouth are very small.



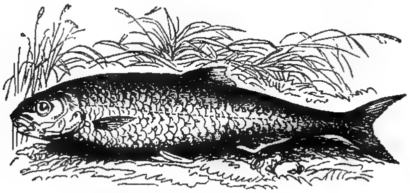
Dab (*Platessa limanda*).

**DABCHICK.** See Grebe.

**DA'CCA**, a city of Bengal Proper, stands about 150 miles to the north-east of Calcutta, in lat. 23° 43′ N., and long. 90° 25′ E. It is situated on the Burha Gunga, a considerable auxiliary of the Dulasseree, which is itself at once a mingled offset of the Brahmaputra and the Ganges, and an affluent of the lower course of the former stream. The city thus enjoys singular facilities in the way of inland navigation. Down to the close of the 18th c., D. was widely celebrated for the delicate texture of its muslins, which, in the phraseology of the East, were characterised as 'flowing water' and 'evening dew;' and, in connection with this manufacture, the French and the Dutch, as well as the English, had extensive establishments in the place. Since 1801, however, these European agencies have disappeared; while the annual value of the elegant fabric, under the influence of British competition, has gradually fallen from £250,000 to nothing at all. The present aspect of the city is in keeping with this utter decay of its staple trade. In many quarters are ruins overgrown with jungle, the haunts of tigers and serpents; and this remark is applicable to numerous splendid edifices, such as the residences of its native princes and the factories of its foreign sojourners. Still D., within a space of 4 miles in length by 1¼ in breath, is understood to contain upwards of 60,000 inhabitants. It seems, of late years, to have partially recovered from the effects of its commercial decline. Besides 180 mosques and 119 pagodas, there are places of worship belonging to Romanists, Armenians, Greeks, and English, both Episcopalians and Baptists. By the last-mentioned denomination, several schools are maintained; and there is also a college, which, in 1850, was attended by 340 pupils—46 Christians, 15 Mohammedans, and 279 Hindus. The temperature at noon averages on the twelve months 79° F.; and the mean rain-fall is said to be 70 inches.

**DACCA**, the district of which the above-mentioned city is the capital, extends in N. lat. from 23° 12′ to 24° 17′, and in E. long. from 90° 11′ to 90° 58′, containing 1960 square miles, and numbering about 600,000 inhabitants. Forming part of the great delta of the Ganges and Brahmaputra, it is traversed by streams in every direction, being so low and level as to be generally flooded during the rainy season. It is, on this account, admirably adapted to the cultivation of rice. From the character of the country, roads—happily rendered less necessary by the net-work of rivers—are very difficult of construction. In addition to the city of its own name, the district has two principal towns, Narainganj and Islampoor. Though the climate, as a whole, is moist, yet it by no means presents uniformity in this respect, the annual rain-fall varying in different years from 46 to 93 inches. Among commercial crops, cotton—the raw material of the far-famed muslins—once occupied a prominent place. It is now comparatively neglected, being too short in the staple for the coarse fabrics which alone continue to be made in the district. Recent attempts to introduce a better variety from the United States have failed. It was in 1765—the epoch of the cession of Bengal, Bahar, and Orissa on the part of the Great Mogul—that D. became subject to England; but down to 1845, the heirs of the native ruler succeeded each other as stipendiaries of the East India Company.

**DACE, DARE,** or **DART** (*Leuciscus vulgaris*), a fresh-water fish of the family *Cyprinidæ* (q. v.), and of the same genus with the roach, ide, chub, bleak, minnow, &c. It chiefly inhabits the deep and clear water of quiet streams. It is found in Italy, France, Germany, &c., and in some of the rivers of England, but is very local. It is in form not unlike the roach, but rather more elongated; the mouth is rather larger, the scales smaller. The upper parts are dusky blue, becoming paler on the sides, and passing into white on the belly, the cheek and gill-covers silvery white. The D. is gregarious, and swims in shoals. Its flesh is preferred to that of the roach, but is not highly esteemed. The D. is perhaps the liveliest and most active of the *Cyprinidæ*, and affords the angler fair sport both with fly and bait. It is fished for with a light float and a fine gut-line. The float is set so that the bait may almost touch the bottom. At the least symptom of a bite, the angler must strike quickly. The best baits are the red-worm, the tail of a lob-worm, gentles, greaves, and flies or grubs of any kind. The best places to fish with bait are moderately sharp streams, of from two to four or five feet deep. Dace at times take the fly very freely, and shew capital sport. Small red and black palmers will be found the most useful flies for the purpose, and their killing properties will be greatly increased if the hook is tipped with a tough gentle, as D. are very apt to follow the fly without taking it, when the gentle overcomes their scruples; a small piece of the white, tough, inner rind of bacon answers equally well; and even a small piece of wash-leather may be used. Shallows, scours, and by the edge of weed-beds, are the best spots for the fly. D. may be taken also by 'dapping' with the natural fly, and those so taken are usually the finest fish. D. seldom exceed a pound in weight, though in some rivers they have been taken up to 1½ lb. In the Thames, a fish of half a pound is considered unusual. They spawn in the end of April, or early in May, and soon recover their condition again.



Dace (*Leuciscus vulgaris*).

**DA'CIA**, the land of the Daci or Getæ. Its geographical limits were very indefinite until its conquest by the Romans. After that period, it comprised the various countries now known as Eastern Hungary, Transylvania, Bukowina, Moldavia west of the Pruth, Wallachia, and the Banat of Temesvár. The Getæ came originally from Thrace, and were divided into various tribes. Their course northward can only be imperfectly traced; but we know that, shortly before the time of Alexander the Great (335 B. C.), they had migrated across the Danube. It is not known when or for what reason the Getæ changed their name to Daci. They seem to have been the most valiant of the Thracian barbarians. Curio, the first Roman general who ever penetrated as far north as the Danube, did not venture to assail them. Julius Cæsar, however, is said to have intended their subjugation. In 10 B. C., Augustus sent an army up the valley of the Maros. From this time, there was almost continual fighting between the Romans and the Daci, on the whole, to the advantage of the latter, who actually compelled their civilised enemies, in the reign of Domitian, to pay tribute. In 101 A. D., the Emperor Trajan crossed the Theiss, and marched into Transylvania, where he fought a great battle near Thorda. The peasant calls the battle-field to the present day *Prat de Trajan* (*Pratum Trajani*, field of Trajan). The Daci, who were commanded by their famous chief Decebalus, were defeated. A second expedition of the emperor's (104 A. D.) resulted in the destruction of their capital, the death of Decebalus, and the loss of their freedom. Roman colonists were sent into the country, a bridge was built over the Danube—the ruins of which are still extant—and three great roads were constructed. In 270—275 A. D., the Romans abandoned the country to the Goths, and the colonists were transferred to Mœsia. After a series of vicissitudes, D. fell into the possession of the Magyars in the 9th century.

**DACIER**, ANDRÉ, a French author, born of Protestant parents at Castres, in Upper Languedoc, 6th April 1651, studied at Saumur; and in 1672 came to Paris, where he was employed to bring out an edition of the Latin writer *Festus*, for the use of the dauphin, which he did in 1681. In 1683, he married Anna Lefèvre, also a Protestant, and two years later, both entered the Roman Catholic Church. D. subsequently became royal librarian, member of the Academie des Inscriptions, and perpetual secretary of the 'Academie.' He died 18th September 1722. D.'s principal works, besides his *Festus*, are *Œuvres d'Horace en Latin et en Français* (Par. 1681—1689), an edition of Valerius Flaccus, and numerous translations into French of Greek authors, such as Plutarch and Epictetus, all of which are of very middling quality, while the expositions and criticisms are extremely shallow.

ANNE DACIER, wife of the preceding, was born at Saumur in 1651, and after the death of her learned father, who had developed her talent, came to Paris, where she acquired such a reputation by her edition of Callimachus (1674), that the Duke of Montausier commissioned her to edit several of the ancient authors for the use of the dauphin. Similarity of tastes and employment led to a marriage between her and André Dacier. Her domestic duties did not, however, weaken her literary ardour. Besides editing various of the classics, she translated the comedies of Terence; the *Amphitryon*, *Epidicus*, and *Rudens* of Plautus, accompanied by an able dissertation on the origin, progress, and mutations of dramatic poetry; Anacreon, Sappho, and the *Plutus* and *Clouds* of Aristophanes. Her admiration of Homer was unbounded, and, in spite of her sex, involved her in two learned controversies. Madame D. is generally acknowledged to have possessed a more acute and vigorous mind than her husband. She died 17th August 1720.

**DACOI'TS, or DACO'TAH INDIANS**, in the United States. See INDIANS.

**DACRY'DIUM**, a genus of trees of the natural order *Taxaceæ*, having male and female flowers on separate trees. The species are lofty trees, chiefly natives of Australia and New Zealand. *D. Franklinii* is called HUON PINE, although rather a yew than a pine. Its timber is harder than any Baltic pine, and is excellent for spars for naval purposes. *D. taxifolium*, the Kakaterra Tree of New Zealand, attains a height of 200 feet, and is also very valuable for its timber. A beverage resembling spruce-beer is made from its branches.

**DA'CTYL** (Gr. *dactylos*, the finger), the name of a measure or 'foot' in Greek and Latin versification, consisting of a long and two short syllables, as in the word *ōmnĭbŭs*. It was so called from its resemblance to the finger, which consists of three joints—one long and two short. The same name is sometimes applied to a trisyllabic measure in English verse, consisting of one accented syllable and two unaccented syllables, as in *déstiny*. See VERSE. Dactylic verses consist of dactyls and equivalent feet. See HEXAMETER.

**DA'CTYLIS.** See COCK'S-FOOT GRASS.

**DACTYLO'LOGY**, the art of communicating thoughts by the fingers. See DEAF AND DUMB.

**DACTYLO'PTERUS.** See FLYING GURNARD.

**DA'DO** (Ital. a die), in classical Architecture, the term applied to the cubic block which forms the body of a pedestal. It is also applied to the plane face and the series of mouldings which, in the interiors of buildings, form, as it were, a continuous pedestal. The interior D. is formed of wood, and, running round the bottom of the walls of a room, serves to protect the plaster or paper from injury. It is generally about three feet in height, and surmounted by a narrow cornice.

**DADU'R**, a town of Beloochistan, is five miles to the east of the Bolan Pass. Though it is in the 30th degree of N. lat., yet it is said to be one of the hottest places in the world. It contains about 3000 inhabitants. It is worthy of notice chiefly as the spot where, in November 1840, the British troops routed a Kelat force. The neighbourhood yields grains of various kinds, pulse, cotton, sugar, madder, and fruits.

**DÆ'DALUS**, according to the Greek myths, was sprung from the old Athenian race of kings, the Erechtheidæ, and was a contemporary of Theseus and Minos. He was famous for his ability as an artist and mechanician. Among the numberless works which he is said to have executed, may be mentioned the Cretan labyrinth, the Colymbethra, or reservoir, near Megaris in Sicily, the temples of Apollo at Capua and Cumæ, that of Artemis Britomartis in Crete, and an altar sculptured with lions on the Libyan coast. His mechanical genius is clearly celebrated in the poetic fiction of his flying safely over the Ægean by means of wings which he had himself made. D. got the credit among the Greeks of having invented carpentry, and most of its tools, such as the saw, the axe, the plumb-line, the gimlet, as also glue. The history of D. is obviously a myth, wherein, as recent criticism has conclusively shewn, is embodied that epoch in which the first rude forms of art were thrown aside, and a higher skill and intelligence displayed.

**DAENDELS, HERMANN WILHELM**, a Dutch general, was born in 1762 at Hattem, in Gueldres, took part in the revolutionary disturbances that broke out in Holland in 1787, and was in consequence compelled to seek refuge in France. In the campaign of 1793, he rendered important service to Dumourier, and was elevated to the rank of a general of brigade. In 1799 he commanded one of the two divisions of the republican army, which, with a third corps under the orders of General Brune, compelled the Anglo-Russian forces to surrender. Circumstances induced him to leave the service in 1803, but in 1806 he was re-instated in his former rank by the king of Holland. He now conquered East Friesland, and was made governor-general of Münster, commander-in-chief of the Dutch cavalry, marshal of Holland, and governor-general of the Dutch East Indian possessions. This last office he held from 1808 to 1811, and discharged its duties with great prudence. He also published a work upon his administration in Java, which was an important contribution to our knowledge of that island. On the overthrow of Napoleon, his services were secured by the new king of Holland, Wilhelm I., who intrusted him with the organisation of government in those colonies on the coast of Africa which had been restored to the Dutch. In this capacity he laboured with energy and success until his death in June 1818.

**DA'FFODIL** (corrupted from Lat. *asphodelus*), the English name of those species of *Narcissus* (q. v.) which have a large bell-shaped corona. The common D. (*N. pseudo-narcissus*) is a native of England and of most parts of Europe, growing in woods and hedges. It is naturalised in many places in Scotland, but seems scarcely indigenous. All the other species are more southerly, chiefly abounding in the countries near the Mediterranean. Some of them, as *N. minor*, have become naturalised in some places in England, having been long known as ornaments of gardens, in which double-flowered varieties are also cultivated. They are favourites, not so much for their beauty, which is not of the most delicate kind, as on account of their large yellow flowers, which are produced early in spring. The bulbs are purgative and emetic. The mode of cultivation is the same as for other species of Narcissus.

**DAG**, a thick clumsy pistol, used in the 15th and 16th centuries. In the *Spanish Tragedy*, published in 1603, one of the characters shoots the dag.

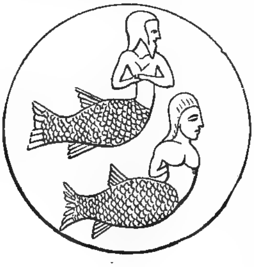
**DA'GGER**, a weapon resembling a sword, but considerably smaller, being used for stabbing at close quarters. Daggers are generally two-edged, and very sharp towards the point. Originally, it had no guard for the hand, and was worn at the girdle in a sheath. It is now regarded as a general military weapon in European countries.

**DAGHESTA'N** (Tartar, *Tagh stan*, signifying mountainous country), a province of Asiatic Russia (called also Derbend), stretching along the west coast of the Caspian Sea, in lat. 41°—43° N., long. 46°—50° E. Area about 8600 square miles. Pop. (1856), 427,931. The surface is generally mountainous, being traversed by offsets from the Caucasus, but there are many valleys and level tracts of great fertility, where the principal kinds of grain are produced, as well as flax, madder, saffron, silk, and tobacco. Cattle-rearing is also a source of considerable employment to the inhabitants, who are composed chiefly of Tartars and of Caucasian tribes. The chief town is Derbend (q. v.).

**DA'GO**, an island in the Baltic Sea, forming a part of the Russian government of Esthonia, situated near the entrance of the Gulf of Finland. The narrow channel called Sele-sund separates it from the island of Oesel on the south. Its length is estimated at about 34 miles, and its breadth at 15 miles. The soil, a mixture of sand and chalk for the most part, is not fertile, the coasts are rocky, and shoals make navigation dangerous. The population, Esthonians mostly, number about 10,000, and are chiefly employed in fishing and cattle-rearing.

**DAGOBA**, or **DAHGOPA** (according to Wilson, from *deha*, the body, and *gopa*, what possesses, because it contains the hair, teeth, &c., of Buddha; according to others, from *dhatu*, a relic, and *gabba*, a shrine), are monumental structures containing relics of Buddha. Dagoba seems to be the common Singhalese term for such monuments; but the more general name is Stupa (q. v.) or Tope.

**DA'GON** (Heb. *dag*, a fish), the national idol of the Philistines, is frequently mentioned in Scripture; in profane history, the name by which it is known is Derceto. It is always represented on ancient medals as half-fish, half-woman, but the Hebrew writer or writers speak of it as a masculine being. Some scholars have attempted to shew that the word D. comes from the Phœnician *dagan*, wheat; and that it is not the name of a fish-god, but of a god of agriculture. It is possible, however, to combine both notions, by supposing that D. was a deified mortal who had come in a ship to the coast, and taught the people agriculture and other useful arts. Ancient history abounds with such mythological personages, one of whom was called by the Babylonians *Odakon*, and is regarded by the learned Selden as identical with the fishy idol of the Philistines.



Dagon.

**DAGUE'RREOTYPE PROCESS**, the name given to the original photographic process as introduced by its inventor, M. Daguerre, in 1839. Notwithstanding that it has now become so unpopular, on account of the very circumstance which gives such perfection to the result—viz., the polish of the plate—it is a process which yields to none in point of microscopic perfection of detail and perfect gradation of shade. The pictures it yields are positive or direct, as given in the camera, though they also appear as negative when viewed at certain angles, and are the result of the successive action of the vapours of iodine, bromine, and mercury upon a highly polished surface of chemically pure silver. The manipulations involved in conducting the process are—1. Cleaning and polishing the plate; 2. Rendering the plate sensitive; 3. Exposing it in the camera; 4. Developing the latent image; 5. Fixing the picture.

A copper-plate of moderate thickness is coated with silver by the electrotype or other suitable method, and then polished to the utmost possible extent, so as to obtain, though by mechanical means, a chemically pure surface; it is then exposed first to the vapour of iodine, and then to the vapour of bromine for a length of time, ascertained in practice by watching the beautiful succession of prismatic colours which begin to appear with the first contact of the vapour. The length of exposure in the camera which follows is determined by the amount of light at the time of operating, and the relation between the diameter and focal length of the lens employed. The development of the latent image, which is the next operation, is effected by exposing the plate in a suitable box to the vapour of mercury, which attaches itself to the various parts of the picture in proportion to the more or less intense action of the light. Those portions of iodide and bromide of silver unacted on by light, are next removed by immersing the plate in a solution of hyposulphite of soda; and the picture is subsequently fixed and intensified by pouring over its surface a solution of hyposulphite of gold, and applying heat; by which means it is coated with a thin film of metallic gold, and thereby rendered so permanent that it cannot be rubbed out by ordinary means, but requires a chemical solvent for its removal. It may be mentioned, in conclusion, that though M. Daguerre published, in 1839, the first *practicable* process for taking pictures by the agency of light, his experiments would seem to have been suggested by the researches of M. Niepce, who, in 1820, obtained impressions on silver plates rendered sensitive by exposure to the vapours of sulphur and phosphorus.

**DAHL**, Johann Christian Clausen, a Norwegian landscape painter, born at Bergen 24th February 1788, was at first intended for the church, but afterwards devoted himself to art. He studied painting for six years under the direction of Professor J. G. Moller. His first attempts were in *genre* and miniature. They did not exhibit much genius; but public attention was at length excited by a work which he exhibited in Dresden in 1819, entitled 'Cascade among Rocks in Norway.' Next year, he went to Italy, where Thorwaldsen and the Prussian consul-general, Bartholdy, commissioned him to execute several works. In 1821, he was appointed professor of painting at Dresden, where he has since permanently resided. D. is fond of reproducing on his canvas the picturesque scenes of his native country, which he has often revisited. Among his more famous works are a 'View of Naples,' 'Winter in Zeeland,' 'View of Bergen,' 'Scene from the Environs of Christiania,' and a 'Winter Scene on the Banks of the Elbe,' the last two of which attracted great attention at the Paris Exhibition of 1855. D. is a member of several academies.

**DAHLGREN GUN**, named after a naval officer in the service of the United States government, is the result of a careful series of experiments on the construction of large ordnance. One peculiarity consists in having relatively less metal in front of the trunnions, and more behind, than had hitherto been customary. Dahlgren guns, made to fire shells or hollow shot, have been introduced to a considerable extent in the United States navy.

**DA'HLIA**, a genus of large perennial herbaceous plants of the natural order *Compositæ*, sub-order *Corymbiferæ*, natives of Mexico. All the varieties in cultivation in our flower-gardens, of which not fewer than 2000 have been carefully enumerated, are derived from two species, *D. variabilis* and *D. coccinea*, and chiefly from the former. Few plants manifest so strong an inclination to sport and produce new varieties as the D., and florists have also obtained many by the artificial fecundation of one with the pollen of another. Dahlias were first brought to Madrid by Spanish botanists in 1789, and were soon introduced into England, but did not become well known in English flower-gardens till about thirty years after. The name was given in honour of Dahl, a Swedish botanist; but because another genus of plants had received the same name, an attempt was made to change it to *Georgina*, which is sometimes used on the continent, but D. universally prevails both popularly and among botanists in Britain. Among the most essential characteristics of a fine D., according to the estimation of florists, are a fulness of the flower, a perfect regularity in the shape of the florets, and the absence of an eye or disc; the florets of the disc, as in other 'double' *Corymbiferæ*, having assumed the appearance of florets of the ray. Dahlias have tuberous roots, which contain a considerable quantity of *Inulin* (q. v.), and are in use as an article of food in Mexico. It was at one time attempted to introduce them into cultivation in Europe for the food either of man or of cattle; but the taste is nauseous to European palates, and even cattle do not readily eat them. Dahlias are often cut down in the northern parts of Britain by early frosts, in the very midst of their flowering; and their tubers require to be taken up for the winter, and stored in a dry place out of the reach of frost till spring. They are propagated by seed, by cuttings, and by tubers. The finer varieties are sometimes grafted on more ordinary stocks.

**DAHLMANN**, Friedrich Christoph, Professor of History and Political Science in the university of Bonn, was born, May 17, 1785, at Wismar. His earlier studies in Copenhagen and Halle were devoted to archæology and philology; but his attention was subsequently directed to the study of politics and the history of the middle ages. The results of his diligence appeared in his *Vita Ansgarii*, his *Researches in German History* (2 vols., Altona, 1822—1823), his edition of the *Dithmarsh Chronicle* (Kiel, 1827), and other works. In 1829, D. was appointed Professor of Political Science in Göttingen, where he published (1830) his valuable work on the *Sources of German History*. Banished in 1837, by King Ernest of Hanover, on account of his protest against the abolition of the Hanoverian constitution, he went to Leipsic and Jena, where he wrote his historical master-piece, the *History of Denmark* (3 vols., Hamburg, 1840—1843). In 1842, he became Professor of History at Bonn, and took a prominent part in the political affairs of Germany after the movement in 1848. Equally opposed to the tyranny of the mob and of the crown, he headed the party of constitutional liberals, who were unfortunately too reasonable to be successful. At the close of the struggle, he returned to his academic duties.

**DAHOME'Y**, an independent state of Guinea, Western Africa, extending along the coast from Fort Badagry on the east, to the river Volta, which separates it from Ashantee on the west. Its limits have not been precisely defined, but it is usually regarded as extending back to the Kong Mountains. It will thus lie between lat. 6°—8° 50′ N., and long. 0° 30′—3° E.; its breadth being about 200, and its length 180 miles. D. is for the most part a vast plain, rising with gentle ascent from the sea towards the Kong Mountains, with offsets of which it is traversed in its most northerly parts. Although it has no river of any importance save the Volta on its western boundary, it is well watered by springs and streams; and the soil, a rich, red-coloured clay, almost quite free of stones, is extremely fertile. Magnificent trees clothe the hills in the north, and maize, beans, and pease grow in splendid luxuriance on the plains, as well as yams, potatoes, melons, limes, oranges, pine-apples, and other tropical fruits; cotton, sugar, tobacco, and indigo are also raised. The scenery is described as exceedingly varied and beautiful. Lions, tigers, elephants, hyænas, and enormous snakes of the boa kind abound. The Dahomans, who came into possession of this tract of country about the beginning of the 18th c., are for the most part tall, well-formed, and intelligent, and, for an African race, singularly honest and far advanced in agriculture. With the exception of a few Mohammedans, whose religious belief is in no way interfered with, they are all pagans, and practise fetish-worship. The king is the most absolute of despots, having entire control over the lives and property of his subjects. Wholesale murder is one of the chief features in religious and state ceremonies, and the most valued ornaments of the royal residence are human skulls. As many as 2000 human victims are sometimes sacrificed at one 'grand custom;' and the present king immolated 7000 at the death of his father. Of the regular army of 12,000, about one-half are Amazons (devoted to celibacy), who are described as much more effective soldiers than their male companions in arms; but at the same time as bloodthirsty and ferocious as tigresses. The revenue, until recent years, depended greatly upon the sale of slaves; but the vigilance of the cruisers employed to prevent the traffic, has reduced this source of income materially. Hence the monster slave-hunts which periodically took place, in order to supply slave-traders, are now comparatively rare. Pop. estimated at 200,000.—Abomey, the capital city, and the royal residence, is situated about lat. 7° 30′ N., long. 1° 40′ E. It is stated to be eight miles in circumference, is surrounded by a ditch, and clay walls, pierced by six gates, in each of which are two openings—one for the exclusive passage of the king, the other for his subjects. The houses are mostly of one story, built of clay, and thatched. There are no regular streets, each house standing within its own enclosure of clay wall. There are three palaces belonging to the king here, which differ little from the other houses, save in their greater extent and higher roof. There are two markets, but no shops. Farms are cultivated within the city, its large space in proportion to the population (30,000) admitting of this. See Forbes's *Dahomey and the Dahomans* (2 vols., Lond. 1851).

**DA'HRA**, a district of Algeria, once inhabited by the Ouled-Riahs, a Kabyle tribe. It has acquired a melancholy celebrity as the scene of a frightful massacre perpetrated by the French in the month of June 1845. The district contains immense caverns. In these the Ouled-Riahs, hotly pursued by the French under Colonel (now Marshal) Pelissier, took refuge. They were ordered to surrender their arms and horses, and were promised, in return, life and liberty. On their refusal, fascines were made up, kindled, and placed at the entrance of the caves. Thrice Colonel Pelissier sent a flag of truce, exhorting the imprisoned Kabyles to accept his terms, but in vain—the last messenger being received with a discharge of musketry. The fire was therefore again kindled in all its intensity, and gradually the cries of agony from the interior of the caverns ceased, until nothing broke the dead silence but the occasional crackling of the green wood of which the fascines consisted. When the caverns were examined, about 600 dead bodies were found scattered here and there; but it was calculated that in all (including those who afterwards died and those who could not be got at), about 800 had been suffocated by smoke, or gored to death by the maddened cattle whom they had brought with them into their fatal asylum. The news created a great sensation in Paris. Marshal Soult, then minister of war, formally condemned the deed; but Marshal Bugeaud, the governor of Algeria, affirmed that Pelissier had only acted under positive orders.

**DAIMÏE'L**, a town of Spain, in the province of Ciudad Real, twenty miles east-north-east of the city of that name. It is in general tolerably well built; it has several squares, and its principal streets, though unpaved, are wide and comparatively clean. Its chief buildings are the churches of San Pedro and Santa Maria—the former a Doric, and the latter a Gothic structure—a town-hall, and a hospital. D. is environed by fine public walks and gardens, and has manufactures of woollens, linen, blonde lace, &c. Pop. about 10,000.

**DAIR-EL-KA'MAR**, or **DEIR EL-KAMR**, a town in Syria, and the capital of the Druses, about 13 miles south-south-east of Beyrout. It is situated on the edge of a deep and picturesque glen of Mount Lebanon, the banks of which and the slopes above are richly clad with mulberries, olives, and vines, which are cultivated in terraces by an exceedingly industrious population. On the opposite side of the glen stand the ruins of the palace Bteddîn, formerly the residence of Emîr Beshîr, who, for more than half a century, from 1788 to 1840, ruled over the Lebanon with a strong but impartial hand. Population of D. about 8000.

**DAIRY**, all that concerns milk and its management on a farm; or the place or house where the milk is kept, cheese made, &c. (The old word *dey*, the milkmaid who presided over the *deyry* or dairy, is probably allied to *dug*, a teat, and to Lat. *duc-*, to draw, or milk; in Polish, *doic* is to milk; and in Sw., *deja* is a dairymaid). Throughout the best cultivated districts both of England and Scotland, the growing of corn and green crops, and the rearing and feeding of stock, are now generally carried on in conjunction with the dairy. This mixed system of husbandry is certainly productive of better cultivation, and, moreover, divides the farmer's risks, and enables him to make the most both of his stock and his land. Milk-cows, however, still occupy the farmer's chief attention, and dairy-produce still pays the rent throughout most of Ayrshire, many parts of Lanarkshire, and most of the south-western counties of Scotland; amongst many of the smaller tenants in the midland districts of England; in the rich vale of Aylesbury; among the old pastures and small enclosures of the south-western counties; and in Cork and the adjoining Irish provinces. Possessing a mild moist climate, these portions of our island are better adapted for pasture than for corn, and have always been noted for their dairy-produce.

The selection of cattle of a sort profitable for the dairy, is a point of the first importance. Certain breeds have long been famed for their milking properties; at the head of these is generally placed the Ayrshire. In proportion to their small size, and the limited amount of food which they consume, they yield a large quantity of rich good milk, and are highly prized by the dairymen of Glasgow and other Scottish towns. The oxen, however, are of small value, for, unless the produce of short-horn sires, they are poor graziers. The cows of the Channel Islands also stand in high repute. The elegant, deer-like Alderneys are kept, more especially in England, by those who prize rich milk, and many farmers have one or two amongst their herd to impart a higher colour and richer flavour to the milk and butter. Alderneys frequently give 14 quarts of milk daily, and 8 or 9 lbs. of butter per week, while instances occur of their yielding as much as 12 or 14 lbs. The small Brittany breed, scarcely larger than goats, have also of late years been brought to this country, and are profitable for gentlemen's families, and where only one or two cows are kept. These breeds are, however, in little favour with those who, besides dairying, look also to the breeding of profitable grazing-stock. Many families of the short-horns unite, with size, substance, and aptitude for fattening, excellent milking properties. Short-horns, or animals with a large infusion of short-horn blood, constitute the bulk of the handsome and high-priced cows seen twice a week in our metropolitan market, and preferred to all others by the London dairymen. Throughout the north of England, such cows are also in general favour. They are used by Mr Horsfall, whose excellent papers on dairy management, published in the Journal of the Royal Agricultural Society of England, should be read by all interested in this subject. With his liberal dietary, fifteen to twenty cows daily average, for seven or eight months, ten or eleven quarts of milk, producing a pound of butter. Of late, however, many breeders of our more fashionable and prize-taking short-horns have devoted their undivided attention to early maturity, flesh, and quality, neglecting altogether the milking properties. This is to be regretted. The original short-horns, in the hands of the Brothers Colling, Mr Bates, the Earl Ducie, and other earlier breeders, were excellent milkers; and even at the present day certain families are to be found still retaining their ancient character. The Herefords, although used for the dairy in their own and the adjoining counties, are chiefly famed for their good working and feeding bullocks. The symmetrical blood-red Devons are dairied in some of the southern counties, and are reputed fair milkers. The ancient long-horns, once common throughout the midland counties, and much valued for milk, have now given place to more compact, symmetrical, and profitable varieties. Some of the older Scottish breeds were also celebrated for their dairy qualities, and none more so than the long shapely black Fife cows, of which only a scattered few now remain. Amongst Angus, Galloways, and West Highlanders, good milk-cows may also be found. Of Irish breeds, the neat hardy black cow of Kerry is well known, alike for the quantity and richness of its milk.

Good milking animals of every breed possess certain qualities in common, which guide the farmer in profitably recruiting his dairy-stock. They have neat, tapering, well-placed heads; small and rather narrow necks; light fore-quarters; oblique rather than upright shoulders; large and shapely udder, well under the belly; largely developed milk-veins; a pliant mellow skin, well covered with soft silky hair. Of great importance, also, is the fact of the animals being descended of parents possessing good milking qualities, for certainly no property is more distinctly hereditary. The milk of small and young cows is usually richer than that of larger or older animals. From four to seven is the most profitable age for the dairy-cow; after that, the milk is poorer; the animals eat more food, especially during winter; and, moreover, become less profitable when dried for feeding. The stock is usually recruited by heifers bred on the farm, which are generally preferred to those bought in. Roan and red colours are most in favour, white animals being rather more delicate and dainty, especially as calves and year-olds.

There is much truth in the old Scottish adage, 'What gangs in at the mou [mouth] maks the guid milk-coo [cow].' In no department of the farm is liberal and regular management more satisfactory and remunerative; in none are carelessness and irregularity more hurtful and ruinous. To produce large quantities of good milk, it is absolutely necessary to supply the cow with the materials from which such milk can be easily elaborated. These briefly consist of albuminous materials and phosphates for forming the caseine, and oily matters for producing the butter. In the ordinary dietary of cows, these materials, especially during winter, are seldom present in sufficient amount to produce, without waste, a copious flow of good milk. Cows yielding 12 or 15 quarts of milk, and fed on good meadow-hay alone, will require daily the large and wasteful amount of 28 or 30 lbs., and even then, never maintain their condition during the earlier periods of lactation. The addition of 20 lbs. of mangold or Swedes will not always prevent loss of weight. A still greater falling-off in flesh and fat—a constant robbing, in fact, of the materials of the body to supply the secretion of milk—is observed in the case of cows kept on the Scotch system on straw and a full allowance of turnips. Under better management, the expensive hay and roots may be materially reduced in quantity, and the adequate amount of nutriment supplied by such articles as bean-flour, rape or cotton cakes, bran, malt coombes, and the like; whilst sufficient bulk—an important matter in the feeding especially of ruminants—is attained by the use of chopped straw. The cutting of straw into chaff is gradually commending itself to all stock-masters; a larger amount of straw is eaten, and thus becomes nearly twice as valuable as when employed merely as litter. Bean-straw, when steamed or fermented with pulped or grated roots, loses entirely its bitter flavour, and being rich in albuminous matters, is specially adapted for milking-cows. A portion of the roots, or all of them where the supply is small, should be pulped, mixed with the cut chaff, and the mixture allowed to lie in a heap for a day or two before being used. With the roots should be added 3 or 4 lbs. of rape-cake and 2 lbs. of bran for each cow. The moisture and flavour of the succulent roots permeate the dry food, inducing fermentation, with the development of sugar, and the mass thus becomes more palatable and digestible. Sometimes the mixture is steamed and given warm; and for milk-cows in cold weather, one or two such messes given daily, usually pay for the cost and trouble of steaming. Of the mixture thus fermented or steamed, the cows should have as much as they can eat thrice a day. Cows in full milk, or intended to be speedily fattened, should have sprinkled over it a small quantity of bean or wheat meal, to the extent of 1 lb. or even 2 lbs. daily. After each meal, give 3 lbs. of good meadow-hay, and be careful never to allow of hay or anything else more than can be cleared up at once and with relish. In most parts, especially of England, cabbage and green rape form the best succulent food for the first two winter-months; turnips and Swedes for the next two; whilst mangold should serve until the grass is abundant in spring; but it should ever be borne in mind, that animals thrive best on varied and frequently changed food. A few feeds of mangolds, when the Swedes are the staple root, and *vice versâ*, besides being a pleasing variety, will be found to augment the quantity of the milk. Rape-cake answers for milk-cows quite as well as the more expensive linseed-cake, especially when its bitter taste is got rid of, as already advised, by fermenting or steaming. The oily matters of the rape being nearly the same as those present in good butter, may account, as has been ingeniously suggested by Mr Horsfall, for its being specially suitable for milking-cows. This, in its main features, is the system of winter-feeding recommended by Mr Horsfall in his excellent papers above referred to. We can also, from some considerable experience, testify to its merits, and believe that all who have fairly tried it have had good reason to be satisfied with the results. The increased produce and condition of the cows, with the augmented value of the manure, repays the trouble and cost. Each cow in full milk daily consumes about

| | *s.* | *d.* |
|---|---|---|
| 20 lbs. bean, oat, or wheat straw, cut into chaff, say at 37*s.* per ton, . . | 0 | 4 |
| 56 lbs. turnips, Swedes, or mangold, part pulped, at 10*s.* . . . . | 0 | 3 |
| 4 lbs. rape-cake, ground, at £5, 12*s.*, . | 0 | 2¼ |
| 4 lbs. bran, at £6, . . . | 0 | 2½ |
| 9 lbs. meadow-hay, at £4, . . . | 0 | 3¾ |
| 1 lb. bean or wheat meal, . . | 0 | 1 |
| Attendance, including chaff-cutting, cooking, &c., . . . . | 0 | 2 |
| Total, . . . | 1 | 6½ |

The summer-feeding of cows is more natural and less expensive than the winter. In the English dairy counties, they are grazed upon the old pastures, which are for this purpose always preferred to those more recently laid down; whilst in Scotland they are pastured upon the clovers. They should never have to work hard for their meals, and should further receive in the house, when brought in for milking, cut clover and rye-grass. Unless in the case of very fine and rich pastures, an allowance of rape-cake is also advisable. Such management not only improves the yield and quality of the milk, but supports the cows in high condition, and maintains the pastures in high and increasing fertility. This last matter is worthy of consideration, for under the older system, many of the once famed dairy-farms of Cheshire and other counties have rapidly declined in value. The tons of butter and cheese carried away from the soil have left it poor and unprofitable. In such circumstances, the use of bones and other such manures, by improving the condition of the soil, have also greatly improved the nutritive quality of the grass and hay. The produce of good land in high condition is always more valuable alike for dairy and for feeding purposes. It is worthy of remark, that a given acreage will support more animals, if the produce be cut and brought to them, than if they are permitted to depasture it. The advantages of both systems are, however, secured by running the cows at grass during part of the day, and giving them cut clover in the house during the remainder. Throughout the early and later part of the season, it is better that the animals be out during the day, and in at night; but in the intense heat of a warm summer, their being housed in the day secludes them from the attacks of troublesome flies, and permits their grazing undisturbed during the cool of the night.

A good supply of water is necessary for milk-cows, which require much more than feeding-stock. In winter, they should have access to it at least twice a day, and require it still oftener in summer. Adequate shelter, and comfortable and convenient buildings, are very essential to successful management. Cows kept, as is still common in the south of England, even during an inclement winter, in open yards, or worse, on the bare damp poached pastures, cannot yield rich milk under any system of feeding: the materials which ought to go to the formation of butter are wastefully spent in supporting animal heat. Cows in full milk are most profitably kept in well-ventilated byres or hovels, of which the winter temperature should fall little below 60°.

The heifer may be put to the male when about two years old. The period of gestation is nine calendar months, or 284 days, but is usually shorter in young animals, and when the calf is a female. During pregnancy, cows fortunately are little liable to disease. Abortion occasionally occurs, and is most common about the third or fourth month. The heifer will receive the ordinary food of store-stock until within six or eight weeks of calving, when it will be profitable to diet her as recommended for cows. It is a great mistake to starve cows in calf; half the summer passes before they recover from the effects of such parsimony. In older cows, especially if good milkers, for a fortnight before calving, the bowels must be kept relaxed, the teats drawn, and any milk removed several times a day, and an occasional dose of salts given. Such simple precautions will prevent that apoplectic form of milk-fever which destroys so many excellent milk-cows. The enlargement of the udder, and appearance of milk, the loosening of the ligaments of the pelvis, the relaxation of the vulva, and the animal's evident desire to be alone, betoken the approach of parturition. The act is generally accomplished speedily and easily, and without requiring much assistance. The calf usually comes with its forelegs first, and its head rather on one side, with the nose between the knees. The cow generally stands, and as the calf drops, the navel-string is ruptured. With a wisp of straw, the little animal is rubbed dry, and receives either from its mother, or from a bottle, a small quantity of the rich new milk popularly known as the 'beastings' or cherry-curds, technically termed the colostrum (q. v.). In this the caseine is mostly displaced by more easily digested albumen; whilst the large amount of sugar and oily matter promotes the clearing out of the bowels. Where valuable stock are reared, they are generally suckled by their dam thrice daily for three weeks or a month; then receive from the bucket six or eight quarts of new milk twice a day, for which a portion of skim is gradually substituted, until, after three or four months, the milk is discontinued, and the animal subsists on grass, hay, or other such food, which in the meanwhile it has been learning to eat. From the time the calf is a fortnight old, it should have a small box in its crib, and be twice a day supplied with a few slices of Swedes or mangold, sprinkled with a little ground wheat, bruised linseed-cake, oatmeal, or any other such nutritive food. Rapid, continuous, and healthy growth is thus insured; the calf is easily and safely weaned; and if such feeding is continued, the animal goes on thriving, and, what is most important, never loses his calf's flesh. To prevent calves sucking each other, it is well to tie them up for an hour after feeding. Those intended for veal should have plenty of new milk three times a day, as much wheat-meal as they will eat, and be tied up constantly in a dark place. Rearing calves should not be tied up, as is too often done in Scotland, but have a comfortable, warm, well-littered, cheerful, and freely ventilated house. Three or four may be placed together, but overcrowding must be sedulously avoided. The cow after calving should have a drink of meal and tepid water, to which a little salt may be added. For the first week, steamed food, bran-mashes, with good hay, constitute the best food: roots at all times, and cold water during winter, are best withheld. Cleansing drinks are quite uncalled for; and if the placenta do not come away within twelve hours after calving, it may be very properly and safely removed by any one accustomed to such offices.

In England, milking is usually done by men, eight or ten cows being allotted to each, and the operation, except in the case of newly calved cows, being repeated only night and morning. In Scotland, the milking is done by women, three times a day; and more milk is thus got than by milking only twice. The removing of the whole of the milk at each operation is most essential; indeed, experienced dairymen aver that half their profit lies in carefully getting the last of the milk, which, as is well known, is much the richest. With liberal feeding, such as that above described, well-selected cows yield daily, in a fortnight or three weeks after calving, 12 to 16 quarts, and should continue to do so for six or eight months. Even with the same management, the milk of some cows is especially rich, and yields an unusually large proportion of butter; whilst others are equally remarkable for the way they fill the cheese-tub. A quart of ordinary milk yields about an ounce of butter, and more in summer than in winter; but under good feeding, the amount reaches and even exceeds an ounce and a half, and is tolerably equal at all seasons. A quart of new milk yields four ounces of curd; and in the midland counties of England, each cow is estimated to produce 500 lbs. of cheese in the season.

In the successful management of milk, butter, and cheese, much depends upon the dairy itself. It should have, if practicable, a northern exposure. Proximity to sewers, pigsties, or any offensive smells, must be sedulously avoided. Stone and lime are the best materials. The walls may be advantageously lined with a skirting of brick, or, where the cost is not objected to, with white glazed tiles. A lofty roof and free ventilation must be provided, with windows looking north. A double door is advisable—a light sparred one placed inside, useful in summer for freely admitting plenty of air; and a solid, well-fitting, boarded one, removable in summer, and necessary for keeping out the winter cold. The temperature of the dairy may be further moderated, in hot weather, by allowing a stream of cold water to trickle slowly over the floor, or, better still, round the milk-vessels, placed in large vats, and by hanging throughout the room coarse calico saturated with water several times a day. In winter, hot-water pipes, closed doors, windows protected by straw, and such other appliances, must be resorted to for the maintenance of the desirable temperature of from 50° to 56°. Further to insure an equable temperature, it is advisable to shelter the building with trees and shrubs, and, if possible, have it four or five feet below the level of the ground. No animal food, drying clothes, or indeed anything else, except milk, butter, and newly made cheese, should ever enter its walls. To remove any acidity or noxious emanations, charcoal-powder is sometimes kept strewed on the shelves. An annual whitewashing of roof and walls helps to cleanse and purify. Daily must the floor and shelves be thoroughly scrubbed and washed, and not a drop of spilled milk allowed to remain for many minutes unremoved. By far the neatest and best shelves are of stone or slate, two and a half feet wide, raised on stout iron rods about two feet from the bricked or paved floor. The dishes are best made of earthenware, or oak lined with lead. Where many cows are kept, these last may be conveniently made three feet wide, and four or five feet long. They will thus project six inches over the shelf, and should be provided with a brass plug, by which the milk, when skimmed, can be drawn off without moving the vessels. These, and the milk-buckets, and, indeed, every article that comes in contact with milk or butter, must be kept scrupulously clean. Immediately after use, they should be rinsed out with cold water, and then with hot; wooden and metal articles well-scoured with a wisp of straw, again washed, or, where practicable, dipped into a boiler amongst scalding water, and then set aside for several hours, to dry, air, and sweeten. For scouring purposes, the plaited wisp of straw is greatly preferable to the dish-cloths in common use, as it is more likely to be changed when foul.

The milk, when brought into the dairy, is run through a wire-gauze or horse-hair strainer, into the vessels above described. To encourage the rapid rise of the cream, the layer of milk should be shallow, especially in summer. At the end of 12 or 24 hours, the cream is carefully removed; and in cool weather the milk may stand for another 12 or 24 hours, when it is again skimmed, the residue going to the pigs or calves. The cream removed at the first skimming is always richest and best; and where it is desired that the butter should be first-rate, any subsequent skimmings may be kept separate, and churned by themselves. Churning at short intervals of twice or thrice a week is preferable to allowing the cream to stand for a longer period. Every time cream is added, the contents of the tank or cistern are well stirred, and a little salt added, unless, as in Scotland, where the butter is liked perfectly fresh. The cream should be kept as cool as possible, especially during the several hours preceding churning. For this end, in very hot weather, the cream-tank is sometimes lowered into a conveniently deep well, or placed for several hours in a water-cistern or under a running tap. In such weather, the churning, which generally occupies from 30 to 40 minutes, should be done at night, the butter laid in brine, and made up early next morning. When the whole milk is kept for churning, care must be taken never to add new milk to that which has already been sour. Cheese-making requires so much time and labour, that it is not very popular among the present generation of farmers' wives and daughters, and has of late years been rather on the decline. As with the manufacture of good butter, it requires careful attention, precise regularity, and scrupulous cleanliness. See Cheese.

Railway communication has greatly extended, improved, and even cheapened the dairy supplies of London and other large towns. The night and early morning trains now carry thither from distances of 60, 80, or 100 miles, quantities of butter and milk, the latter in large tins, which in hot weather are usually covered with wetted calico to promote evaporation, and thus keep the milk cool and sweet. The management of the large dairies from which such supplies are mostly drawn, closely corresponds with that described. The sale of the sweet-milk is found to pay better than the making either of butter or cheese. Quantity rather than quality of milk is usually the main requirement, and a liberal amount of soft succulent food is accordingly used. Calves, as soon as dropped, are disposed of, and are carried for rearing into the grazing counties. When butter is made, it is usually from the whole milk, the butter-milk being used for feeding pigs. In London, Edinburgh, and other large towns, the dairymen keep their cows tied in the stall throughout the year, seldom retain them longer than ten or twelve months, usually dispose of them either in a store or fat state so soon as the yield of milk does not pay for the feeding, purchase their fresh ones immediately before or just after calving, pay particular attention in their selection to the appearance and size of the udder and other points indicating good milking properties, and attach great value to high condition, which presents materials readily convertible into the high selling milk. Cut grass, hay, or sound straw, roots raw and boiled, draff or brewers' grains, with an occasional allowance of flour or cake, form the staple articles of diet. A considerable portion of the food is given in a soft sloppy state, water is freely allowed, with frequent supplies of dreg, better known in England as brewers' or distillers' wash. By such diet, a maximum quantity of milk is obtained.

For further information, the reader is referred to the following works: *Dairy Farming*, by John C. Morton; *Dairy Management*, by J. Horsfall, being a republication of the papers above alluded to (Ridgway); *Dairy Management*, by Mrs Scott (Blackwood); articles on Dairy Management in Morton's *Cyclopædia of Agriculture;* and Stephens's *Book of the Farm.*

**DA'IS** (Fr.). This term was used with considerable latitude by medieval writers. Its most usual significations are the following: 1. A canopy over an altar, shrine, font, throne, stall, chair, statue, or the like. The term was applied to the canopy without regard to the materials of which it was composed, which might be cloth, wood, stone, metal, or other substance. 2. The chief seat at the high table in a hall, with the canopy which covered it, from which probably the word in all its significations was introduced, its French meaning being a canopy. 3. The high table itself. 4. The raised portion of the floor, or *estrade*, on which the high table stood, and by which the upper was divided from the lower portion of the hall; and 5. A cloth of state for covering a throne or table. In old writings, the word occasionally takes the form of *dois*, and more rarely that of *dez* or *detz.*

**DAI'SY** (*Bellis*), a genus of plants of the natural order *Compositæ*, sub-order *Corymbiferæ.*—The common D. (*B. perennis*), plentiful throughout Europe, flowers almost all the year in pastures, meadows, and grassy places. What are called double varieties, with flowers of various and often brilliant colours, are very commonly cultivated in gardens, the flowers consisting entirely of florets of the ray. A variety called the *Hen-and-chickens D.*, frequent in cottage-gardens, has the flower (head of flowers) surrounded by smaller ones, the short stems of which grow from the summit of the *scape* or leafless stem. The D. (*Gowan* of the Scotch) has long been a favourite with poets and lovers of nature, characteristic as it is of many of the fairest summer scenes, its blossoms gemming the pastures, and recommended also by its frequent appearance during the severer seasons of the year. Its flowers close at night. It is not found in America. A species of *Bellis* is, however, found in the United States (*B. integrifolia*), but it is confined to Tennessee, Arkansas, and the neighbouring regions. Europe produces some species unknown in Britain, but of little interest; and species of the nearly allied genus *Bellium* are also found in the south of Europe. In the days of chivalry, the D. was the emblem of fidelity in love, and was frequently borne at tournaments both by knights and ladies.

**DAISY,** Michaelmas. See Aster.

**DAKO'TA,** or **DACO'TAH** (so called from the Dacotah Indians or Dacoits—see Indians), a territory of the United States, bounded by Minnesota on the east, Nebraska on the south, Washington on the west, and the British possessions on the north. It was formerly part of the territory of Minnesota, but was detached when that became a state. D. is in length 450 miles, its average breadth is about 200 miles, and it has an area of 70,000 square miles. The 45th degree of north latitude runs across the middle of the territory, which is watered by the Missouri and its branches. D. includes open grassy plains, high rolling prairies, and abounds in game furnishing valuable furs. The land is fertile and well-timbered, and is rich in coal and other minerals. The territory was only organised in 1860, and as yet the country is but meagerly settled.

**DALAI'-LA'MA.** See Lamaism.

**DALAMOW**, a city of Oude, on the left bank of the Ganges, in lat. 26° 4′ N., and long. 81° 7′ E. It is 68 miles above Allahabad. Pop. stated at 10,000, of whom only 250 are said to be Mohammedans. D. has long been regarded as a holy place in connection with its sacred river, having two antique temples of Siva on the margin of the stream, and an ancient ghat or stair for aiding the ritual ablutions of the pilgrims.

**DALARADIA**, the ancient name of a territory in Ireland which comprehended what is now the southern half of the county of Antrim, and the greater part of the county of Down. It was sometimes also called *Cric na Cruithne*, 'the region of the Picts,' from the Irish name of its inhabitants, otherwise called the Dal Araidhe, 'the race of Fiacha Araidhe,' a chief or prince of Ulster, who is said to have lived about 236 A.D. The name continued in use till the end of the 12th century. It must not be confounded with DALRIADA (q. v.).

**DA'LBERG** (formerly, DALBURG), the name of an ancient and noble German family, of which several members held, by hereditary right derived from the oldest times of the middle ages, the office of chamberlain to the archbishopric of Worms. So great was the renown of the D. family, that at every coronation of a German emperor the royal herald exclaimed: 'Is there no Dalberg here?' whereupon the representative of the family kneeled, and received from the new emperor the dignity of 'first knight of the empire.' Several members of this family have been celebrated as patrons of literature and art, of whom the most distinguished is

DALBERG, KARL THEODOR, BARON VON, Chamberlain of Worms and Archbishop of Regensburg, born at Hernsheim, February 8, 1744. He studied in Göttingen and Heidelberg, and, after some time passed in travel, devoted himself to the church. At Erfurt, of which he was appointed governor, 1772, he was active and generous as a patron of literature and art, and also contributed greatly to the social and commercial welfare of the little state placed under his control. After holding several high offices in the church, D. was sent to Paris (1804), in order to assist in adjusting several ecclesiastical affairs with Napoleon and Pope Pius VII. He died at Regensburg, February 10, 1817. D. was as highly respected as a ruler and a scholar as for his private character. During his whole life, he cultivated the friendship of those eminent in literature and art, such as Goethe, Schiller, Wieland, &c. His writings—marked by sound learning and eloquence of style—include a treatise *On the Influence of the Arts and Sciences on Social Order* (1793), and *Pericles, or the Influence of the Fine Arts on the Public Welfare* (1806). These were his favourite objects of study; but natural history, chemistry, botany, mineralogy, and agriculture, also engaged his attention.

**DALBE'RGIA**, a genus of trees and climbing shrubs of the natural order *Leguminosæ*, sub-order *Papilionaceæ*, having a stalked membraneous pod, which is flat, tapers to both ends, and contains 1—3 flat seeds. The leaves are pinnate, with a terminal leaflet. All the species are natives of warm climates. Some of them are valuable timber-trees, particularly the SISSOO of Bengal (*D. Sissoo*), much prized, and more extensively used in the north of India than any other timber-tree except the Sal (q. v.). *D. monetaria*, a native of Surinam, yields a resin very similar to Dragon's Blood.

**DALECA'RLIA**, or **DALARNÉ** (signifying 'valley-country'), an old province of Sweden, now forming the län or county of Fahlun or Falun (q. v.). The Dalecarlians are celebrated for the part they took under Gustavus Vasa in freeing their country from the yoke of Christian II. of Denmark.

**DALGA'RNO**, GEORGE, an almost forgotten but very able author, was born at Aberdeen about 1626, studied at Marischal College, and afterwards kept a school in Oxford for 30 years, where he died August 28, 1687. He deserves to be remembered for two remarkable works—the *Ars Signorum, Vulgo Character Universalis et Lingua Philosophica* (Lond. 1661); and *Didascalocophus, or the Deaf and Dumb Man's Tutor* (Oxf. 1680). The former is a very ingenious attempt to represent and classify ideas by specific arbitrary characters irrespective of words. It contains the germs of Bishop Wilkins's subsequent speculations on a 'real character and a philosophical language.' Leibnitz has repeatedly alluded to it in complimentary terms. The latter work has for its design, 'to bring the way of teaching a deaf man to read and write, as near as possible to that of teaching young ones to speak and understand their mother-tongue.' D. has the great merit of having anticipated, by more than 130 years, some of the most profound conclusions of the present age respecting the education of the deaf and dumb.

**DALHOU'SIE**, MARQUIS OF, JAMES ANDREW BROUN-RAMSAY, Governor-general of India, third son of the ninth Earl of D., was born April 22, 1812, at Dalhousie Castle, Midlothian. He was educated at Harrow, and graduated at Christ Church, Oxford. In 1832, by the death of his only remaining brother, he succeeded to the honorary title of Lord Ramsay. In 1835, he contested the representation of Edinburgh, in the Conservative interest, against the Whig candidates, Sir John Campbell, afterwards Lord Campbell, and Mr Abercromby. He bore his defeat with great good-humour. In 1836, he married the eldest daughter of the eighth Marquis of Tweeddale; in 1837, was elected for Haddingtonshire. On the death of his father, in 1838, he succeeded to the earldom of D., and became a member of the Upper House. In 1843, he was appointed, by Sir Robert Peel, Vice-president of the Board of Trade, and in 1845 succeeded Mr Gladstone as President of the Board. The 'railway mania' threw an immense amount of labour and responsibility upon his department; but the energy, industry, and administrative ability he displayed in his office, no less than his readiness and fluency in parliament, marked him out for the highest offices in the state. When Sir Robert Peel resigned office in 1846, Lord John Russell, who succeeded him, paid the Earl of D. the rare compliment of asking him to remain at the Board of Trade, in order to carry out the regulations he had framed for railway legislation and intercommunication. In 1847, he was appointed Governor-general of India, as successor to Lord Hardinge, and arrived in Calcutta, January 12, 1848—the youngest governor-general ever sent to that country. His Indian administration was not less splendid and successful, in regard to the acquisition of territory, than in the means he adopted for developing the resources of the country and improving the administration of the East Indian government. Pegu and the Punjab were conquered; Nagpore, Oude, Sattara, Jhansi, and Berar were annexed—altogether, four great kingdoms, besides a number of minor principalities, were added to the dominions of the Queen under his governor-generalship. Railways on a colossal scale were planned, and partly commenced; 4000 miles of electric telegraph were spread over India; 2000 miles of road between Calcutta and Peshawur were bridged and metalled; the Ganges Canal, the largest of the kind in the world, was opened; the Punjab Canal was undertaken; important works of irrigation all over India were planned and executed; and the official department of public works was re-organised. Among other incidents of his beneficent administration may be cited the permission to Hindu widows to marry again; relief to persons of all sects from the risk of forfeiting property by a change of religion; the improvement of education and of prison-discipline; the organisation of the Legislative Council; the improved training of the civil service, covenanted and uncovenanted; and the reform in the postal service of India, whereby a letter from Peshawur to Cape Comorin, or from Assam to Kurrachee, is now conveyed for three-farthings, or $\frac{1}{16}$th of the old charge. These, and many other achievements of his Indian administration, will be found in a minute which he drew up on resigning office, in which he reviewed, with pardonable pride, the events of his eight years' governor-generalship. His constitution had never been strong, and it gave way under the incessant labour and responsibility imposed upon him by his noble ambition. Meanwhile, honours had been showered upon him by his queen and country with no sparing hand: in 1848, he was made a Knight of the Scottish order of the Thistle; in 1849, he received the marquisate, the thanks of both Houses of Parliament and of the East India Company, for the 'zeal and ability' displayed in administering the resources of British India in the contest with the Sikhs, immediately previous to the annexation of the Punjab; in 1852, on the death of the Duke of Wellington, he was nominated by the then prime minister, the Earl of Derby, to the office of Constable of her Majesty's Castle of Dover, and Lord Warden of the Cinque Ports. D. sailed from Calcutta in March 1856. On his arrival in England, he was unable to take his seat in the House of Lords; and the remainder of his days was spent in much physical suffering and prostration of strength. On the 19th December 1860, he died at Dalhousie Castle in his 48th year, leaving behind him a name that ranks among the highest in the roll of Indian viceroys for statesmanship, administrative vigour, and the faculty of inspiring confidence among the millions subjected to his sway. As he died without male issue, his title of marquis became extinct on his death, the earldom of D. and other Scottish honours reverting to his cousin, Baron Panmure.

**DA'LIAS**, a town of Spain, situated in the province of Almeira, 20 miles west-south-west of the city of that name, and about 4 miles from the Mediterranean. It is badly and irregularly built, and is subject to earthquakes. Pop. 9000, who are employed chiefly in mining, smelting, and fishing.

**DALKEI'TH**, a burgh of barony, 6 miles south-east of Edinburgh, standing on a narrow strip of land between the North and South Esk, and near the junction of these two streams. It chiefly consists of one main street. Pop. (1861) 7114. It has one of the largest corn-markets in Scotland, has a large and commodious market-hall erected in 1854; manufactures of brushes, woollens, and hats; besides iron-foundries, tanneries, and coal-works. D. arose round an ancient castle, which was long a great stronghold. The regality of D. was successively held by the Grahams, the Douglases, the Earls of Morton, and the Earls of Buccleuch—the latter having bought it from the Mortons in 1642. During the minority of James VI., D. Castle was the chief residence of the Regent Morton; hence it was called the Lion's Den. General Monk lived in it during his government of Scotland under Cromwell. Dalkeith Palace, the chief seat of the Duke of Buccleuch and Queensberry, built about 1700 on the site of the old castle, is a large square structure overhanging the North Esk, amid fine grounds, in which the two Esks flow and unite. This palace has been visited by Froissart, James VI., Charles I., George IV., and Queen Victoria. In addition to the old parish church, there is a second parish church, a fine cruciform structure in the early English style, built (in 1840) and endowed by the Duke of Buccleuch. Within the grounds of the palace is a very elegant Episcopal chapel. In an ancient chapel attached to the parish church are the recumbent statues of an Earl and Countess of Morton.

**DALKISSO'RE**, a river of Bengal Proper, joins the Hoogly from the right at Diamond Harbour, about 30 miles below Calcutta. It has a south-east course of about 170 miles, rising in lat. 23° 30′ N., and long. 86° 34′ E. In its lower section, the D. assumes the name of the Roopnerain. That channel of the Hoogly which receives the Roopnerain, has of late years become silted up through the same cause to which the adjacent delta owes its existence, so as to be now frequented only by native craft. Nor does it, on other grounds, afford a desirable passage upwards, for as the tide sets strongly into the Roopnerain, as offering less resistance to its progress, many vessels bound to Calcutta have been swept up the shallow estuary, and lost.

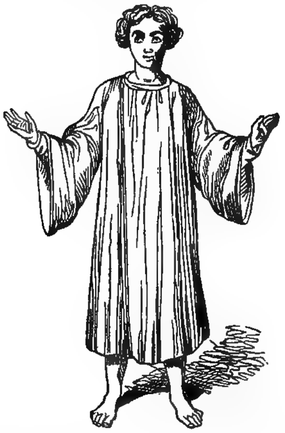
**DA'LLAS**, George Mifflin, an American statesman and diplomatist, was born at Philadelphia, July 10, 1792. He was educated at Princeton College, where he graduated with high honours in 1810. Soon after he was called to the American bar, he accompanied Mr Gallatin in his special embassy to St Petersburg as private secretary. On his return, he resumed the practice of the law, and successively filled the offices of deputy of the attorney-general of Philadelphia, mayor of Philadelphia, and district-attorney of Philadelphia, an office which his father had held. In 1831, he represented Pennsylvania in the senate of the United States, but after two years retired, and resumed his profession. In 1837, he was appointed American minister at St Petersburg, but was recalled in 1839. In 1844, he was elected vice-president of the United States, and held this office until 1849. In 1856, he succeeded Mr Buchanan as American minister at the court of St James's. He was empowered to settle the Central American question; but shortly after his arrival, a dispute between the two governments, arising out of the dismissal of Mr Crampton, the British minister at Washington, by the president of the United States, threatened to bring the diplomatic mission of D. to a premature termination. Through the forbearance of Lord Palmerston, he was, however, permitted to remain, and discharged the duties of American minister until 1861, when he was succeeded by Mr C. F. Adams. In person, he is tall, and of venerable aspect. He has diligently applied himself to study the politics and institutions of the mother-country, and during his embassy, assiduously attended the debates in both Houses of Parliament.

**DALLES**, romantic and perilous rapids on the Columbia or Oregon, form, along with the Chutes above them, and the Cascades below them, an almost continuous interruption between the tide-water of the river and its long reach—about 400 miles—of comparatively practicable navigation towards the interior. They are subdivided, reckoning downwards, into the Little D. and the D. Proper. On the latter, the basaltic rocks, which, from a considerable distance above, bound the channel, suddenly confine the stream to one-third of its width, with a perpendicular wall on either side; while the damming up of the plunging surges fearfully aggravates the difficulties and dangers of the descent.

**DALMA'TIA**, a narrow strip of territory, extending along the Adriatic Sea, and bounded on the N. by Istria and Croatia, on the E. by Bosnia and Herzegovina. Lat. 42° 15'—44° 54' N., long. 14° 30'—19° E. It forms, with its adjacent islands, the most southern crownland of the Austrian empire. Area, 4881 square miles; pop. (1857) 404,499. The coast of D. is everywhere steep and rocky, and the adjacent series of islands, divided by picturesque straits and channels, are of a like character. Numerous bays intersecting the coast form excellent havens and landing-places. Offsets from the Dinaric Alps traverse the interior, and attain in Mount Orien, the highest culminating point, an elevation of 6332 feet; the Velebich Mountains, separating D. from Croatia, and which belong to the Julian Alps, have a height of more than 5000 feet. The mountains of D., for the most part composed of limestone, present a bleak and barren aspect, with many romantic chasms and fissures, through which dash impetuous mountain-streams. The chief rivers—none of which, however, are of any importance—are the Zermagna, Kerka, Cettina, and Narenta, the second and third of which are broken in several places by beautiful cascades and falls. The lakes are numerous, but, with the exception of Lake Vrana—which is separated from the Adriatic by only a narrow tongue of land, and the waters of which are brackish—they are periodical, drying up in summer, and filling their beds in late autumn. A large part of the whole area of D. consists of moor and morass, yet in summer there is often a great scarcity of water. The climate is in general warmer than that of any other part of Austria, the African sirocco being occasionally felt on its shores. The minerals are limestone, coal, gypsum, &c. Agriculture is in a backward state. About one-ninth of the land is arable, and produces wheat, barley, oats, maize, rye, and potatoes. Wine and olives are also produced. More than half of the land is in pasture, and wood occupies about a fifth. The islands are not very fertile, but supply good timber for ship-building. Cattle-rearing, sea-faring, and the fisheries on the coast, are the chief kinds of industry. The exports in 1855, consisting principally of wine, oil, brandy, hides, wool, wax, honey, and fruits, amounted to £503,295, and the imports to £670,163. The shipping-trade of D. in 1859 employed 27,770 vessels, with an aggregate burden of 783,074 tons. Of the whole population, it is computed that about 30,000 are Italians, 1000 Albanians, 410 Jews, and the remainder consists of Southern Slavonians, or the Dalmatians, and Morlaks. The Dalmatians are a fine race of men—bold and brave as seamen and soldiers—and formerly were the main support of the military power of Venice. But it must be added that they are deceitful and rapacious, while the love of independence is extreme. They speak the Illyrian-Servian or Herzegovinian dialect; but the language used in the government offices, especially in Spalatro, is the Italian. The Morlaks—who inhabit the interior, the mountainous districts, and the Turkish sanjak of Hersek—are also good soldiers, hospitable and faithful to their engagements, lovers of independence, but it is said they are addicted to robbery and drunkenness. D. is divided into four circles—Zara, Spalatro (or Spalato), Ragusa, and Cattaro. These are also the names of the chief towns.

In ancient times, D. was a considerable kingdom, and, after many unsuccessful attempts, was first subjugated by the Romans in the time of Augustus. After the fall of the Western Empire, D., which had formed the most southern part of the province Illyricum, was captured by the Goths, from whom it was taken by the Avari (490), who in their turn yielded it to the Slavonians about 620. The state founded by the Slavonians continued until the beginning of the 11th c., when King Ladislaus of Hungary incorporated a part of D. with Croatia, while the other part, with the title of Duchy, placed itself under the protection of the Venetian republic. The Turks afterwards made themselves masters of a small portion; and by the peace of Campo-Formio (1797), the Venetian part of D., with Venice itself, became subject to Austrian rule; and when Austria, in 1805, had ceded this part of D. to Napoleon, it was annexed to the kingdom of Italy; afterwards (1810) to Illyria. Since 1814, D., excepting the Turkish portion, has been reunited with Austria.

**DALMA'TIC** (*Dalmatica*), the deacon's robe, in the Roman Catholic Church. The most ancient form of the D. is exhibited in the annexed wood-cut, after an early Christian painting on the walls of catacombs at Rome. It was originally of linen, but it is now generally made of the same heavy silk as the Planeta (q. v.), worn by the priest.



**DALRI'ADA**, the ancient name of a territory in Ireland, comprehending what is now called 'the Route,' or the northern half of the county of Antrim. It signifies primarily, 'the race of Riada;' and secondarily, 'the country of the race of Riada,' i. e., Cairbre Righfada, or 'Cairbre of the Long Arm,' the son of a chief or prince of the Scots in Ireland, and himself a warrior of note. He lived in the 3d c., and not only obtained an ascendency in the district of Ireland which came to be called after him, but, according to some writers, planted a colony of his Scottish countrymen on the shores of Argyleshire in Alba, or Albany, as Scotland was then called. It is certain that about 506 A.D. some of his descendants, led by Loarn, Fergus, and other sons of Eirc, son of Muinreamhar, passed over to Argyleshire, where they settled themselves permanently, and founded the kingdom of 'Dalriada in Albany,' or 'the Scots in Britain.' More than twenty kings of this state are enumerated before Kenneth MacAlpin, who, about 843, united under one sceptre the Dalriads, or Scots, and the Picts, and thus became the first king of Albany, which about two centuries afterwards began to be known as Scotia or Scotland.

**DALRI'ADS**, or **DALREUDI'NI**, the inhabitants of Dalriada (q. v.).

**DALRY'MPLE FAMILY**, a very old and

illustrious Scottish family, deriving its name from the lands of Dalrymple in Ayrshire. The principal members are:

DALRYMPLE, JAMES, VISCOUNT STAIR, a lawyer and statesman, son of a small proprietor in Ayrshire, was born at Drummurchie, in the same county, May 1619, educated at Glasgow University, and at an early age, entered the army raised in Scotland to repel the religious innovations of Charles I. But the bent of his mind lay towards civil and literary pursuits; and in 1641, he was appointed professor of philosophy at Glasgow. The use which he made of philosophy, however, was rather to aid him in basing law—his favourite study—on profound and comprehensive principles, than to add another metaphysical system to those already in existence. In short, his wish was to be a philosophic lawyer, rather than a philosopher. In 1648, he entered as an advocate at the Scotch bar, where he rapidly acquired great distinction; in 1649, and again in 1650, he was appointed secretary to the commissioners sent to Holland by the Scottish parliament to treat with Charles II.; and in 1657, was induced —but with difficulty—to become one of the 'commissioners for the administration of justice' in Scotland under Cromwell's government. Dalrymple was a conscientious, but at the same time an exceedingly moderate and enlightened royalist; and although appointed one of the new Scotch judges after the Restoration, he resigned his seat in 1663, because he could not take the 'Declaration' oath, which denied the right of the nation to take up arms against the king. His great talents, however, induced the monarch to accept his services on his own terms. Dalrymple was now created a baronet. In 1671, he became Lord President of the Court of Session. As a member of the Privy Council, he was invariably the advocate, though not always successfully, of moderate measures. In 1681, when the infamous 'test' oath was under consideration, Dalrymple, with the dexterity of a lawyer, caused John Knox's Confession of Faith to be introduced as a part of the test; but as this Confession inculcated resistance to tyranny as a duty, the one half of the test contradicted the other. Dalrymple's private conscience, however, was more fastidious than his public one, for he himself refused to take the very oath which, by his ingenuity, he had virtually deprived of its despotic character, and in consequence had to resign all his appointments. Before this, he had published the *Institutions of the Law of Scotland*, which is still the grand text-book of the Scotch lawyer. The disquisitions are both profound and luminous, characterised alike by their philosophic insight and their sound common sense. After some time spent on his estate in Wigtonshire, Dalrymple went to Holland in 1682, to escape the persecution to which he was subjected at home. During 1684—1687, he published at Edinburgh—though he himself was then residing at Leyden—his *Decisions;* and in 1686, at Leyden, a philosophic work in Latin, entitled *Physiologia Nova Experimentalis.* He accompanied the Prince of Orange on his expedition to England. When matters were prosperously settled, William re-appointed him Lord President of the Court of Session, and elevated him to the peerage under the title of Viscount Stair. He died 25th November 1695.

JOHN DALRYMPLE, eldest son of the preceding, held office under James II., and also under William III. While Secretary of State for Scotland, he incurred great odium on account of his share in the barbarous transaction known as the 'Massacre of Glencoe.' In 1703, he was elevated to the earldom of Stair. He died in 1707.—SIR JAMES DALRYMPLE, second son of Viscount Stair, was the author of *Collections concerning Scottish History preceding the Death of David I.* (1705), and the grandfather of Sir John Dalrymple of Cranstoun, author of that excellent work, *Memoirs of Great Britain and Ireland, from the Dissolution of the last Parliament of Charles II. until the Sea-battle off La Hogue.*—The other sons—Viscount Stair had altogether nine children, five sons and four daughters—were more or less distinguished.

DALRYMPLE, JOHN, second Earl of Stair, second son of the first Earl of Stair, and grandson of Viscount Stair, was born at Edinburgh, July 20, 1673. He had the misfortune, while young, to kill his elder brother, by the accidental discharge of a pistol. This unhappy circumstance induced the parents, both for their own comfort and that of the boy himself, to educate him away from home. He was placed under the care of a clergyman in Ayrshire, who, by his prudence and kindness, soon developed the excellent qualities of the youth. Dalrymple afterwards went to Leyden, where he had the reputation of being one of the best scholars in the university. He completed his curriculum at Edinburgh. In 1701, he accepted a commission as lieutenant-colonel of the Scottish regiment of foot-guards, and gained the highest distinction in Marlborough's campaigns. When the accession of the Tory ministry, in 1711, put a stop to the brilliant career of the great duke, Dalrymple retired from the army. When George I. succeeded to the throne, Dalrymple—who had become Earl of Stair by the death of his father in 1707—was made a lord of the bedchamber, a privy-councillor, and commander-in-chief of the forces of Scotland. Next year, he was sent as ambassador to France, in which capacity he exhibited the highest ability, and was of the greatest service in traversing the schemes for the reinstatement of the Pretender; but as he refused to flatter his countryman, Law—notorious in connection with the fatal Mississippi scheme—who was then omnipotent in France, the government was mean enough to recall him. For 22 years he lived in retirement at Newliston, near Edinburgh, devoting himself chiefly to agriculture, which was then beginning to improve in Scotland. He was the first to plant turnips and cabbages in the open fields. In 1742, he was sent as ambassador to Holland, and in the following year served under George II., at the battle of Dettingen. Later, he was made commander-in-chief of the forces of Great Britain. He died at Queensberry House, Edinburgh, 9th May 1747.

DALRYMPLE, SIR DAVID, a Scottish judge and historical antiquary, commonly known as Lord Hailes, was born at Edinburgh, 28th October 1726. He was the grandson of Sir David Dalrymple, youngest and reputedly the ablest son of Viscount Stair. He was educated first at Eton, afterwards at Edinburgh, and finally at Leyden, whence he returned to Scotland in 1746. In 1748, he was called to the Scottish bar, where his success was highly respectable, but not astonishing. Dalrymple was a man of extensive culture and classical tastes, of sound judgment, and great industry, but a very indifferent orator; and, in consequence, men of far inferior powers often acquired a greater reputation and a more lucrative practice. In 1766, he was appointed one of the judges of the Court of Session, and assumed the title of Lord Hailes, by which he is chiefly known to posterity. His accuracy, diligence, judicial impartiality, and dignified demeanour, secured him the highest respect in his new office. Ten years after, he was made a justiciary lord. He died 29th November 1792.—Although Dalrymple's official duties were very arduous, he found time to compose numerous works, surpassing in value those of many men whose lives have been wholly devoted to literature. We can afford to mention only a few: *A Discourse on the Gowrie Conspiracy* (1757); *Memorials and Letters relating to the History of Britain in the Reign of James I.* (1762), a curious and interesting volume; *The Works of the ever-memorable John Hailes of Eton, &c.* (1765); *Memorials and Letters relating to the History of Britain in the Reign of Charles I.* (1766); *Annals of Scotland from the Accession of Malcolm III., surnamed Canmore, to the Accession of Robert I.* (1776); and *Annals of Scotland from the Accession of Robert I., surnamed the Bruce, to the Accession of the House of Stuart* (1779). Besides these, Dalrymple wrote works on legal antiquities and ancient church history, edited old Scotch poems, and published sketches of the lives of various notable Scotchmen, as specimens of how a *Biographia Scotica* might be executed.

**Dalrymple, Alexander**, F.R.S., F.S.A, younger brother of the preceding, was born at New Hailes, the seat of his father, near Edinburgh, 24th July 1737. In 1752, he obtained an appointment in the East India Company's service; but his extreme youth, as well as the imperfect education he had received at home, rendered it necessary, on his reaching Madras, that he should be placed under the storekeeper for a time. Lord Pigot himself, at that time governor of the presidency, condescended to give him lessons in writing; but young Dalrymple having, unluckily for his own prospects, fallen upon some papers in the secretary's office relating to the commerce of the Eastern Archipelago, became so engrossed with the importance of the subject, that after some bickerings with his superiors, he relinquished his appointment, and made a voyage of observation among the eastern islands. At Sooloo, in the course of his expedition, he concluded a commercial treaty with the sultan, which might have led to beneficial results; but on his return in 1762, he found political affairs entirely changed, small-pox raging, and most of his influential friends dead. The scheme, in consequence, proved a failure. In 1765, he returned to Britain, to urge its importance on the home-authorities, but did not succeed. In 1775, however, he was sent out to Madras as a member of council, but was recalled in two years, apparently without good reason, for in 1779 he was appointed hydrographer to the East India Company, and shortly after received a pension. In 1795, when the Admiralty resolved to establish a similar office, it was conferred on Dalrymple, who held it till within a short period of his death, which occurred 19th June 1808, at Marylebone, London. Dalrymple wrote a vast number of letters, pamphlets, &c., containing plans for the promotion of British commerce in various parts of the world, political dissertations, accounts of geographical expeditions, &c. His library was rich in works of navigation and geography, all of which were purchased by the Admiralty. His collection of poetry, also very valuable, was deposited in the library at New Hailes, as a family heirloom.

**DA'LTON, John**, was born September 5, 1766, at Eaglesfield, near Cockermouth, in Cumberland. He received his early education in the school of his native place, and, after 1781, in a boarding-school kept by a relative in Kendal. Here his love of mathematical and physical studies was first developed. He wrote several mathematical essays, and, in 1788, commenced a journal of meteorological observations, which he continued throughout his whole life. In 1793, he was appointed teacher of mathematics and the physical sciences in the New College at Manchester, where he chiefly resided during the remainder of his life, though frequently employed, after 1804, in giving lectures on chemistry in several large towns. In the years 1808—1810, he published his *New System of Chemical Philosophy*, 2 parts (Lond.), to which he added a third part in 1827. In 1817, he was appointed president of the Literary and Philosophical Society at Manchester. He was also a member of the Royal Society, and of the Paris Academy, and, in 1833, received a pension of £150, afterwards raised to £300. In the same year, D.'s friends and fellow-townsmen collected £2000, to raise a statue to his honour, which was executed by Chantrey, and placed at the entrance of the Royal Institution in Manchester. D. was also honoured by the university of Oxford with the degree of D.C.L., and with that of LL.D. by the university of Edinburgh. He died, universally respected, at Manchester, July 27, 1844. His chief physical researches were those on the constitution of mixed gases, on the force of steam, on the elasticity of vapours, and on the expansion of gases by heat. In chemistry, he distinguished himself by his progressive development of the Atomic Theory (q. v.), as also by his researches on the absorption of gases by water, on carbonic acid, carburetted hydrogen, &c. His treatises are mostly contained in the *Memoirs of the Literary and Philosophical Society of Manchester*, the *Philosophical Transactions*, Nicholson's *Philosophical Journal*, and Thomson's *Annals of Philosophy*. Besides these, we have his *Meteorological Essays and Observations* (Lond. 1793; 2d edit. 1834). D. was unquestionably one of the greatest chemists that any country has produced. Profound, patient, and intuitive, he had precisely the faculties requisite for a great scientific discoverer. His atomic theory elevated chemistry into a science. In his habits, D. was simple; in his manners, grave and reserved, but kindly, and distinguished by his truthfulness and integrity of character.

**DA'MAGES**, in Law, are the pecuniary recompense claimed on account of suffering an injury through the act of another. The peculiar constitution of the English common-law courts, which, till lately, prevented them in most cases from giving any other remedy than by way of D., rendered the questions relating to this subject of unusual importance; but the progress of recent legislation has been in the direction of restricting actions for D. to the cases in which the restitution of property or enforcement of a right cannot be otherwise attained. The Court of Chancery, on the other hand, could not give D., it could only enforce performance of an obligation by personal restraint, and hence, according to the nature of the remedy desired, the suitor resorted to the one or other court. In Scotland, the supreme court has always been able to give redress in either way.

Where a sum ascertained in amount is due, the action is one not properly for D., but of debt. But where the sum is not ascertained, as where an injury has been done to a man's character or property, the action in either country can in general only be for D., the amount of which the injured party estimates, and which is determined by the judgment of the court, or verdict of a jury, subject to certain fixed rules which the courts have laid down, as the principle according to which the estimation is to be made. These, it is obviously impossible to detail here, and reference must be made to the title of the special subjects out of which a claim may arise for such information as it is practicable to give. It may be observed, however, that it is a general rule to restrict the amount of D. to that of the actual pecuniary loss, wherever it can be ascertained; and that neither in Scotland nor England will a stipulated penalty for breach of agreement be accepted as determining the sum due for D., unless it shall appear, by the use of the term 'as liquidated damages,' or some equivalent expression, that both the parties had intended to fix conclusively the sum payable in case of default. Other general rules are, that the injury for which D. are claimed must have affected the claimant individually, and not merely as one of the general public, although it is not essential that the injury should have done material hurt to him, as this only affects the amount of damages. And the injury suffered must have been the direct and immediate consequence of the act done; if it has only been a secondary or remote result of the act, no D. will be given. And any act sued on must be an actual injustice; it is not enough that it produces disadvantageous results, if these arise only from doing what the party was justified in doing. D., therefore, may be sued for in respect of a crime involving liability to criminal punishment; but in England, in the case of a felony, no action for D. will lie against the offender, because it is the duty of the complainant to prosecute him criminally. It is otherwise, however, in the case of misdemeanours; an action for D. is there independent of criminal proceedings. In Scotland, this is the rule in reference to every species of crime.

**DAMA'N**, a seaport town, province of Guzerat, Hindustan, belonging to the Portuguese. It stands at the mouth of the Daman Gunga, or Daman River, which rises in the Syadree Mountains, as the upper extremity of the Western Ghauts is called by the natives, in lat. 20° 11′ N., and long. 73° 42′ E. Common spring-tides give at least three fathoms on the bar, while outside is a roadstead of more than double that depth. The harbour affords good shelter from the south-west monsoon, and, as the neighbourhood is well-stocked with suitable timber, the people are largely employed in the building and repairing of ships. The peculiar drawback of the locality is the scarcity, or rather the want, of fresh-water. The river, even when swollen by the rains into an inundation, is brackish, and the wells likewise are so in some degree. Endemic fevers are the natural consequence. The place is fortified with a rampart and bastions, and it is described as having been, before the arrival of the whites, 'a town great and strong.'

**DAMAN**, an outlying portion of the Punjab, runs about 300 miles along the right or west bank of the Indus, extending back, with an average breadth of about 60 miles, as far as the Suliman Mountains. It stretches in N. lat. from 28° 40′ to 33° 20′, and in E. long. from 69° 30′ to 71° 20′. In the absence of irrigation, the district in general is little better than a plain of smooth, bare, hard clay—the result of alternate inundation and evaporation. But when duly irrigated, this baked and burned surface becomes very productive, more especially in the strip of land—known as the Derajat—which is nearest to the bordering stream.

**DA'MAN** (*Hyrax*), a genus of quadrupeds, highly interesting as a connecting link between the *Rodentia* and the *Pachydermata*. On account of their small size, their thick fur, and their general appearance, they were always ranked among the former, till Cuvier pointed out their essential agreement, in dentition and anatomical characters, with the latter, and assigned them a place next to the elephant and the rhinoceros, remarking, that 'excepting the horns, they are little else than rhinoceroses in miniature.' He adds that 'they have quite similar molars, but the upper jaw has two stout incisors curved downwards, and during youth, two very small canines, the lower jaw four incisors without any canines.' The skull, also, and other bones of the head, resemble those of the pachyderms. The muzzle is short; the ears, short and round. The ribs are more numerous than even in the pachyderms—21 pair, a number exceeded in no quadrupeds except the sloths, whereas no rodent has more than 15 pair. The toes are united by the skin to the very nail, as in the elephant and rhinoceros, and are round and soft, merely protected in front by a broad nail, which does not reach the ground. The legs are short. The tail is a mere tubercle. There are several species of this genus, natives of Africa and of the south-west of Asia. The SYRIAN D. (*H. Syriacus*) is now generally believed to be the *shaphan* of the Old Testament, the *Cony* (q. v.) of the authorised English version, an illustration of which will be found under article CONY. The D. is common in Syria and Palestine, inhabiting rocky places, and sheltering itself in the holes of the rocks, but not burrowing, for which its feet are not adapted. It is a timid harmless creature, quick and lively in its movements, completely herbivorous, easily domesticated, and, in confinement, readily eating bread, roots, fruits, and herbs. It is about eleven inches long, and ten inches high; brownish-gray above, white beneath, the thick hair interspersed with long scattered bristles. The ASHKOKO (*H. Abyssinicus*) of Abyssinia, first described by Bruce, and supposed by him to be the shaphan, is now believed to be distinct from the Syrian D., although very similar. The KLIP-DASSE (*H. capensis*) of South Africa differs from the shaphan in its darker colour and rather larger size, and also in having only three toes on each foot, whereas the Syrian D. has four toes on the fore-feet and three on the hind-feet. It is very common in rocky places in South Africa, both on the hills and near the sea-shore. Its favourite food consists of aromatic plants, and its flesh, although eatable, is highly flavoured. In the places which it frequents, a peculiar substance called *Hyraceum* (q. v.) is found—an animal secretion, to which medicinal virtues are ascribed, but the nature and origin of which have not yet been thoroughly ascertained.

**DAMA'R**, a town of Yemen, Arabia, pleasantly situated on an elevation about 120 miles north-north-west of Aden. It has about 5000 houses, is the residence of a governor, and has a college, attended by several hundred students.

**DAMASCE'NUS**, JOANNES, the author of the standard text-book of Dogmatic Theology in the Greek Church, was born at Damascus about 700 A. D. On account of his eloquence, he was surnamed *Chrysorrhoas* ('Golden Stream'). In 730, he became a monk in the convent of St Saba at Jerusalem, where he spent the rest of his days in the composition of theological works. He died about 756 A. D., and had the honour of being canonised by both the Latin and Greek churches. D. was a man of extensive erudition, and was considered the ablest philosopher of his time; but the word 'philosopher' must have meant something very different in those days from what it does now, as D.'s writings are characterised by weakness of judgment and want of critical power. The best edition is that of Le Quien (2 vols., Paris, 1712).

**DAMA'SCUS** (Arabic, *Dimishkesh-Shâm*), a city of Syria, the largest in Asiatic Turkey, occupies a situation of unrivalled beauty on a luxuriant plain at the eastern base of the Anti-Libanus, and 53 miles east-south-east of Beyrout, which forms its port, lat. 33° 27′ N., long. 36° 23′ E. The appearance of the city from a distance is beautiful in the highest degree. The bright buildings, sparkling beneath a Syrian sun, rise out of a sea of various tinted foliage, while all around—save on the north-west, where stretches the long bare snow-white ridge of the Anti-Lebanon—extend charming gardens, rich cornfields, and blooming orchards, with the river Barrada (the Abana of Scripture) and its branches winding through until they lose themselves far to the east in the Lake Bahr-el-Merj, into which the Phege (the Pharpar of Scripture), a smaller stream, also flows. As in the case of all eastern cities, the expectations excited by a distant view of D. are by no means realised on a close inspection. The city proper is about 6 miles in circumference, and is partly surrounded by old tumble-down walls, portions of which date from early Roman times, while other parts are of Saracenic architecture, and some mere mud-patches of the present day. The streets generally are dirty and decayed, and so very narrow that a loaded donkey almost entirely blocks up the passage. The best street is 'Straight Street,' mentioned in the Acts of the Apostles in connection with St Paul. The houses for the most part are very mean-looking structures, often presenting to the street nothing but a dead-wall with a doorway in it, while the best have rough mud-walls, with a projecting upper story extending so far over the narrow street that hands may be shaken from opposite windows. But as the interior of the city presents a sad contrast to its charming surroundings, so do the rich interiors of the houses contrast with their miserable externals. Fine marble-paved courts ornamented with trees, shrubs, and fountains, rooms with arabesqued roofs and walls, most luxuriously furnished, are the common features of all the dwellings of the wealthier classes. The principal buildings of D. are places of worship, chief of which is the Great Mosque—formerly a heathen temple, then a Christian church—composed of different kinds of architecture, and occupying a quadrangle 163 yards by 108 yards, the interior dimensions being 431 feet by 125. The floor is of marble tesselated, and covered with Persian carpets, and the walls and piers of the transept are enriched with beautiful devices formed of various coloured marbles, while rows of noble Corinthian pillars divide the interior into nave and aisles. Altogether, this is one of the handsomest ecclesiastical buildings of which Mohammedans can boast. The citadel is large and imposing, but not strong; and the Great Khan is a splendid building, erected of black and white marble. There are many interesting remains of antiquity in D., but they are lost amid the mean modern structures and the bazaars. The latter are numerous, and finer than those of Cairo or Constantinople, and very well supplied with goods of European as well as Oriental manufacture; each class of goods having a street or bazaar for itself. The manufactures of D. are important, consisting of silks, cottons, coarse woollen cloth, jewellery, saddlery, and arms. The Damascus blades, once so famous, have lost the high reputation they had, but those made are still good. The coffee-houses are among the most attractive of the East. D. has an extensive trade, carried on by means of camels with the inhabitants of the eastern desert. The trade with Bagdad was large; but in 1857 the caravan was plundered on its way across the desert, the loss to the merchants of D. being estimated at £40,000. This paralysed the commerce. The annual caravan to Mecca from D. at one time consisted of some 50,000 or 60,000 persons, most of whom engaged to some extent in trade; but the facilities which in recent years have been afforded for making the pilgrimage by way of Egypt and the Red Sea, has caused a considerable diminution in the pilgrims, and consequently in the trade. But the greatest blow at the prosperity of D. was struck in 1860, when the Druses (q. v.) entered the city, and destroyed about 6000 houses in the Christian quarter, killing from 3000 to 5000 persons, and selling many of the women into Turkish harems. The imports of British goods, chiefly plain and printed calicoes, cotton handkerchiefs, and cotton yarn, were approximately valued in 1858 by the British consul at £150,000. The population of D., including the adjoining village of Salahíyeh, is stated at 150,000, of whom about 130,000 are Mohammedans, 15,000 Christians, and 5000 Jews.

D. is perhaps the most ancient city in the world. Josephus attributes its foundation to Uz, the great-grandson of Noah; but whether it dates so far back or not, it is certain that it was a place of consequence in the days of Abraham. During the time of the Hebrew monarchy, it was the capital of Syria. It afterwards passed successively under the rule of the Assyrians, Persians, Macedonians, Romans, and Saracens; and finally, in 1516, it was captured by the Turks under Sultan Selim I.—in whose hands, with the exception of a short interval (from 1832 to 1840), when it belonged to the Pasha of Egypt, it has remained ever since. Under every change of dynasty and every form of government, D., unlike most cities, has retained its prosperity.

The pashalic of D. comprises all the territory between the Lebanon and the Euphrates—that is, all between lat. 31°—36° N., and long. 35°—41° E. The surface is for the most part level and very fertile, and produces grain of various kinds, hemp, flax, silk, cotton, madder, tobacco, and cochineal. It is considered the most important pashalic of Turkey, and its pasha takes high rank at the Ottoman court. Pop. about 500,000.

**DA'MASK**, the name given to all textile fabrics in which figures of flowers, fruits, or others not of geometrical regularity, are woven. The word is supposed to be derived from the city of Damascus having been an early seat of these manufactures. From the intricacy of the early process, the art of D. weaving was long a mystery confined to a few localities; but since the introduction of the Jacquard-machine, it is extensively employed wherever ornament is wanted in the stuffs used for dress or house-furnishings. The rich satins and brocades of Lyon and Spitalfields, the flowered ribbons of Coventry, and the bed and window curtains of Halifax and Bradford, are all examples of D. manufacture; but it is in the department of table-linen that the art has had its widest scope and greatest triumphs. The principal seats of the manufacture, on the continent of Europe, are at Courtrai and Liege in Belgium, and in some parts of Saxony, Silesia, and Austria; in England, to an inconsiderable extent at Barnsley, in Yorkshire; in Ireland, at Belfast, Lisburne, and Ardoyn; and in Scotland, at Dunfermline, which may be called the metropolis of the manufacture, the production of that town being at least equal to that of all Europe, one factory there turning out 10,000 yards daily by steam-power alone, besides a large quantity by hand-loom, and employing about 1400 hands.

There are three descriptions of D. known in the trade—viz., 1. Full Harness, which is generally employed in patterns of limited size and minute detail, the peculiarity being that the Jacquard-machine only lifts one thread by each needle, and in such cases, the pattern is repeated to fill up the breadth wanted. 2. 'Single' or 'Common' D., in which any number of threads, from two to seven, can be lifted by one needle, to form the pattern; while the ground is produced by a set of five shafts and heddles, giving from twice to seven times the extent of pattern obtained from the same machine by the full-harness process. In full harness and single D. goods, a square fabric is considered the proper medium, that is, the warp and weft equal; but sometimes a thread or two less or more on warp or weft is used, according to the effect wanted to be produced. 3. In Double D., the pattern is produced in the same way as in single, and the ground formed by eight shafts and heddles, forming what the weavers call an eight-leaved twill, absorbing one-half more weft than warp, and giving that fine satin-like ground which distinguishes double damask. Besides these descriptions of D., within the last ten or twelve years, a mixed cotton and woollen coloured fabric in table-covers has been introduced, and is now manufactured extensively, the ground of which is woven with twelve shafts.

To give an idea of the capital required to work the finer branches of the trade, it may be mentioned, that it is quite usual for the mere designing and painting of a pattern to cost £50; and £70 has been paid for some extensive designs; while it is known that one pattern lately executed cost £600 of outlay, ere a yard of cloth could be brought to market, employing seven Jacquard-machines, consuming 50,000 cards, and containing 4800 threads in the square yard. No statistics of the trade have been collected since 1836, when there were in Dunfermline 3000 D., and 517 diaper looms, and the capital embarked in the trade was estimated at £826,261, and the total number of persons employed 5044. Since then, from the introduction of steam-power, the hand-looms have decreased; but the number of hands employed, and the value of the goods manufactured, have greatly increased.

**DAMASKEE'NING**, or **DAMASCE'NING**, is the art of producing upon ordinary steel certain ornamental appearances resembling those observed on the famous Damascus blades. Attention was first drawn to this branch of industry by the Crusaders, who brought from Damascus to Europe many articles made of superior steel, such as sword-blades and daggers. These were found to possess not only great elasticity, united with considerable hardness, but their surfaces were covered with beautiful designs, formed by a tissue of dark lines on a light ground, or light lines upon a dark ground, and occasionally by the inlaying of gold on the steel-blue ground. These Damascus blades appear to have been constructed of steel and iron welded together; and the elegant designs were brought out by immersing the blades in dilute acids, which, eating away unequally the surface, gave rise to the mottled appearance. In genuine Damascus blades, the designs run through the substance of the blade, and the *watering*, or regular, almost symmetrical figuring is not worn off by friction, or even grinding. Imitations of the watering of Damascus steel are produced on common steel by etching with acids; and in this way landscapes, inscriptions, and ornaments, and decorations in general, are imprinted on the steel-blue ground. Gold and silver are also inlaid in the higher-class of sword-blades and other articles. Gun-barrels are occasionally subjected to the process of Damaskeening. Attempts have been made in France to accomplish damaskeening by means of photography, but as yet with very imperfect results.

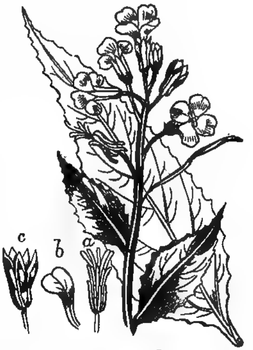
**DA'MASUS**, St, Bishop of Rome, was by extraction a Spaniard, and born probably early in the 4th century. In 366 A.D., he was elected Bishop of Rome, but had to struggle fiercely for the possession of his office with one Ursinus, who was supported by a considerable party. His career was throughout far from peaceful. It was mainly spent in subduing the still numerous Arians in the West; in combating the heresy of Apollinaris, which he caused to be condemned by the council assembled at Constantinople in 382; and in defending the cause of Paulinus against Meletius. He died 384. It is difficult to form a just estimate of D.'s character. His enemies used to call him *Auriscalpius Matronarum* ('The ear-tickler of the married ladies'), and hinted that he was in the habit of inducing rich female penitents to make testamentary bequests in his favour—a conspicuous vice of the clergy at that time; so much so, indeed, that Valentinian was obliged to issue an edict forbidding ecclesiastics to receive such bequests for the future. The edict was addressed to D., who was required to announce it to the church. On the other hand, he was a great friend of St Jerome, and was primarily instrumental in inducing that learned divine to undertake a new translation of the Bible. His extant works consist of seven epistles, addressed to various bishops, and rather more than forty short poems, religious, descriptive, &c., but of little or no merit. The first edition was published at Rome by Sarrazanius in 1638. D.'s festival falls on the 11th December.

**DAMBOO'L**, a vast rock-temple of the Buddhists in Ceylon, containing, among a profusion of carvings, figures of Buddha of extraordinary magnitude. See *Ceylon*, by Sir J. Emerson Tennent (Lond. 1859), vol. ii. p. 577.

**DAME** (Lat. *domina*, a mistress), a title of honour which long distinguished high-born ladies from the wives of citizens, and of the commonalty in general. In the age of chivalry, it was customary even for a queen to be so called by her chosen knight ('the dame of his heart, of his thoughts,' &c.). In consequence of the greater courtesy shewn towards women of higher rank, arose the custom of prefixing the word *ma* to *dame*, as a special proof of veneration and homage. Hence, too, the Virgin-mother was called in France *Notre-Dame* ('*Our* Mistress,' or Lady, as if no one Christian could exclusively claim the privilege of serving her with the homage of his heart). The daughters of the king of France, as soon as they came into the world, were called *Madame;* and this was also the sole title of the wife of the king's eldest brother. In England, the word D., though not much used, is now applied to married women of all classes. *Madame* is shortened into Madam, which is still a word of honour, applicable, in particular cases, to majesty itself. Thus, Alfred Tennyson, in dedicating his poems to Queen Victoria, speaks as a chivalrous troubadour might have done—

> 'Take, *Madam*, this poor book of song.'

**DAME'S VI'OLET** (*Hesperis*), a genus of plants of the natural order *Cruciferæ*, having four-sided or two-edged pods, and containing several species, annual and biennial herbaceous plants, natives, chiefly, of the middle and south of Europe. One only, the COMMON D. V., or WHITE ROCKET (*H. matronalis*), is found in Britain, in hilly pastures, but perhaps rather escaped from cultivation than a true native. It has an erect branched stem, with ovato-lanceolate leaves, and terminated by numerous large lilac-flowers,



Dame's Violet: *a*, a flower divested of calyx and corolla; *b*, a petal; *c*, calyx.

which are scentless by day, but very fragrant at night, on which account this plant is cultivated in flower-pots by German ladies. The custom appears to have been an old English one also, and from it the plant derives its common name. The NIGHT-SCENTED ROCKET (*H. tristis*) is also a favourite flower in Germany.

**DAMIENS**, ROBERT FRANÇOIS, known for his attempt to assassinate Louis XV., was born in 1714 at Tieulloy, a village near Arras, in France. He was evilly-disposed from his youth, being known even then as *Robert le Diable*. On account of a robbery which he had committed, he was obliged to flee into Belgium in 1756, whence he returned to Paris about the end of the year. It was during his absence in that country that he formed the intention of assassinating his sovereign. The motives which led him to this are not well understood. He himself alleged that it was the conduct of the king towards the parliament; while a more popular, but apparently groundless opinion was, that he was instigated by the Jesuits. On the 5th of January 1757, having gone to Versailles on the previous day, he assiduously followed the king and his courtiers about everywhere; and about six o'clock at night, when the king was entering his carriage to leave Trianon, managed to stab him. The king, however, recognised his assassin, and D. was seized. The punishment inflicted on him was horrible. The hand by which he attempted the murder was burned at a slow fire; the fleshy parts of his body were then torn off by pincers; and, finally, he was dragged about for an hour by four strong horses, while into his numerous wounds were poured molten lead, resin, oil, and boiling wax! Towards night, the poor wretch expired, having by an effort of will almost superhuman, kept his resolution of not confessing who were his accomplices—if, indeed, he had any. His remains were immediately burned, his house was destroyed, his father, wife, and daughter were banished from France for ever, and his brothers and sisters compelled to change their names.

**DAMIE'TTA**, a town of Lower Egypt, situated on the right bank of the chief of the Nile's eastern branches, about 8 miles from its mouth in the Mediterranean, in lat. 31° 25′ N., long. 31° 49′ E. It is in general ill and irregularly built, but it has some handsome mosques and marble baths, and several bazaars. Its commerce was formerly important, but it has been much injured by the prosperity of Alexandria. It still, however, carries on a considerable trade with the interior in rice, which grows abundantly in the neighbourhood, and fish. The cloth known as *dimity* received its name from D., where it was first manufactured. A bar at the mouth of the river prevents vessels of more than 50 or 60 tons burden from ascending to Damietta. Pop. 28,000. The existing town was erected about 1251, but, prior to that, a city of the same name (more anciently Tamiâthis) stood about four miles to the south. It was strongly fortified by the Saracens, and formed on that side the bulwark of Egypt against the early Crusaders, who, however, succeeded in capturing it more than once. It was razed, and rebuilt further inland on the site it now occupies, by the Sultan Baybers, who also choked up the mouth of this branch of the Nile by sinking loaded barges across it, to prevent the Christian warriors gaining access.

**DA'MMAR, or DA'MMAR PINE** (*Dammara*), a genus of trees of the natural order *Coniferæ*, distinguished from all the rest of that order by their broad lanceolate leathery leaves, which have numerous nearly parallel veins, and by their seeds being winged, not at the end, but on one side. The tree from which the name, originally applied to its resinous product, has been extended to the whole genus, is the MOLUCCAN D. (*D. orientalis*), which grows on the high mountain-ridges of the Molucca islands. It grows to a great height, attains a diameter of nine feet, and generally has the lower part of the trunk beset with knots as large as a man's head. The timber is light and of inferior quality; and the tree is chiefly valuable for its resin, which is soft, transparent, hardens in a few days, and is then white, with a crystalline appearance. The resin often flows spontaneously from the tree in such quantity, that it hangs in masses like icicles of a handbreadth and a foot long. At another period of the year, it is yellow, and less valued. By incision, especially in the protuberances of the stem, it is obtained in large pieces. So long as *Dammar Resin* is soft, it has a strong smell; but loses it when it dries. It contains only a trace of volatile oil, but consists of two distinct resins, one of which is soluble in alcohol, the other not. It is light, brittle, and easily friable, readily soluble in oil of turpentine; quickly becomes viscid when heated; when sprinkled on burning coal, diffuses an odour like that of rosin or mastich; readily takes fire, and burns with much smoke and a somewhat acid smell. It is used in Asia for domestic purposes, and in the arts like other resins; it is an article of commerce, and in Europe is employed in various ways to form varnishes, which dry quickly, have a very bright lustre, and being colourless, allow the beauty of the colours over which they are spread to be perfectly seen; but readily become viscid again, and are not permanent, so that this resin cannot be made a substitute for copal and amber. It is almost completely soluble in benzole, and in this solvent, makes an excellent colourless varnish for positive photographs on glass—it is, however, scarcely hard enough for negatives.—To this genus belongs also the KAURI PINE (q. v.) of New Zealand (*D. australis*), which produces the resin known as *Kauri Resin*, or *Kauri Gum*.—The word *Dammar*, *Dammer*, or *Damar*, signifies *resin* in some of the languages of India. The resin known as BLACK DAMMAR is obtained in the Molucca Islands from the trunk of *Marignia acutifolia*, a tree of the natural order *Amyridaceæ*. It is a semi-fluid soft resin, with a strong smell, becoming black when it dries: it is used as pitch, also to yield a kind of turpentine, which is obtained by distillation.—*Canarium microcarpum*, a tree of the same order, also a native of the furthest east, yields, by incision of the trunk, a viscid, odorous, yellowish substance, very similar to Balsam of Copaiva, which is called *Damar* or *Dammar*, and is used in naval yards as oakum, being mixed with a little chalk and the bark of reeds, and becomes as hard as a stone.—Quite distinct from all these is the resin also called *Dammar* or *Piney Dammar* in India, often also called Copal (q. v.) in India, and *Anime* (q. v.) in Britain, the produce of *Vateria Indica*, a large tree of the natural order *Dipteraceæ*. It is obtained by wounding the tree, and when fresh, is clear, fragrant, and acridly bitter; when dried, it becomes yellow, brittle, and glass-like. It is used in India as a varnish (*Piney Varnish*), which is hard, tenacious, and much esteemed. It is also made into candles in Malabar, which, in burning, diffuse an agreeable fragrance, and give a clear light with little smoke. Some of these candles were sent to Britain, and were highly prized, but the excessive duty stopped the importation. *Shorea robusta*, the Sal (q. v.), so much valued in India as a timber-tree, also of the natural order *Dipteraceæ*, and some other species of *Shorea*, yield a resin, also known as *Dammar*, and as

*Ral* and *Dhoona*, which is much used in dockyards in India as pitch.

**DAMMU'DAH**, or **DUMMO'DAH**, a river of India, rises in Ramgurh, a district in the sub-presidency of Bengal, about lat. 23° 55′ N., and long. 84° 53′ E.; and after a generally south-east course of 350 miles, it enters the Hoogly from the right, in lat. 22° 13′ N., and long. 88° 7′ E. The valley of the D.—traversed, or to be traversed by the main railway between Calcutta and the North-west—abounds in coal and iron; and competent judges have calculated that bar-iron may here be manufactured 20 per cent. cheaper than it can be imported from Great Britain.

**DA'MOCLES**, one of the courtiers and sycophants of the elder Dionysius, the tyrant of Syracuse. It is recorded by Cicero that D., having lauded in the highest terms the grandeur and happiness of royalty, was reproved by Dionysius in a singular manner. The sycophant was seated at a table, richly spread and surrounded by all the furniture of royalty, but in the midst of his luxurious banquet, on looking upwards, he saw a keen-edged sword suspended over his head by a single horse-hair. A spectacle so alarming instantly altered his views of the felicity of kings.

**DA'MON AND PY'THIAS**, or **PHI'NTIAS**, two noble Pythagoreans of Syracuse, who have been remembered as models of faithful friendship. Pythias having been condemned to death by Dionysius the tyrant of Syracuse, begged to be allowed to go home, for the purpose of arranging his affairs, Damon pledging his own life for the reappearance of his friend. Dionysius consented, and Pythias returned just in time to save Damon from death. Struck by so noble an example of mutual affection, the tyrant pardoned Pythias, and desired to be admitted into their sacred fellowship.

**DAMPER**, a door or valve which, by sliding, rising and falling, turning on a hinge, or otherwise, diminishes the aperture of a chimney or air-flue; this lessens the quantity of air that can pass through a furnace or other fire, and thus 'damps' or checks the combustion.—The D. of a pianoforte is that part of the mechanism which, after a key is struck, and the finger is lifted up from the key, immediately checks or stops the vibration of the string. It consists of a second hammer, which, on the rising of the key, strikes the string and remains upon it, instead of bounding off as the sounding-hammer does. Perfect damping is always desirable, but seldom obtained, especially in upright pianofortes. In respect of damping, the pianofortes of the German makers are superior to the English. The more perfect the damping is, the more distinctly and clearly the passages and harmony are heard, while the instrument gains in purity of tone, when there is none of that confusion of sounds which arises from imperfect damping.

DAMPER is also the name given in Australia to a simple kind of unleavened bread formed of wheat-flour. It is made while travelling in the bush, and baked among the ashes of a fire often kindled for the purpose.

**DA'MPIER**, WILLIAM, a celebrated English navigator, was born of a Somersetshire family in 1652. He early went to sea, where he was soon distinguished alike by his intelligence and enterprise. Along with a party of bucaneers, D. crossed the Isthmus of Darien in 1679, and embarking on the Pacific in canoes and similar small craft, captured several Spanish vessels, in which they cruised along the coast of Spanish America, waging war with the Spanish subjects. In 1684, D. engaged in another bucaneering expedition, in which he coasted along the shores of Chili, Peru, and Mexico, sailing thence to the East Indies, touching at Australia, and after some time returning to England, where in 1691 he published an interesting account of the expedition, entitled *A Voyage Round the World.* He was afterwards deputed by government to conduct a voyage of discovery to the South Seas, in which he explored the west and north-west coasts of Australia, also the coasts of New Guinea, New Britain, and New Ireland, giving his name to the Dampier Archipelago and Strait (q. v.). The events of the latter part of D.'s life are not well known. Besides the one already mentioned, the following are his principal works: *Voyages to the Bay of Campeachy* (Lond. 1729); *A Treatise on Winds and Tides;* and a *Vindication of his Voyage to the South Sea in the Ship St George* (1707).

**DAMPIER ARCHIPELAGO AND STRAIT** take their names from the famous navigator and bucaneer. The *strait*, which is 35 miles wide, separates the island of Waygiou from the north-west extremity of Papua or New Guinea, lying almost immediately under the equator, and about long. 131° E., so as to be, as nearly as possible, the antipodes of the mouth of the Amazon. The *archipelago*, again, is off the north-west coast of Australia, about lat. 21° S., and long. 117° E. The principal islands of the cluster are Enderby, Lewis, Rosemary, Legendre, and Depuch.

**DAMPING OFF**, in Horticulture, the death of plants from excess of moisture in the soil and atmosphere. Young seedlings in stoves and hotbeds are particularly liable to it. Although the cause is sufficiently obvious, prevention is not always easy; not only because some plants are very sensitive as to moisture, but also because the necessity of keeping sashes closed on account of temperature often stands in the way of the ventilation which would otherwise be desirable, and it is when a moist atmosphere stagnates around them, and the temperature is not very low, that plants are most liable to damp off.

**DA'MSON**, a rather small oval-fruited variety of the common plum, much esteemed for preserving, and not wholly unfit for dessert. The tree grows to a considerable height, but has a bushy, sloe-like appearance. It is extremely fruitful. There are many sub-varieties, with fruit of different colours, dark purple, bluish, black, yellow, &c. Damsons are produced in great quantities in some parts of England. D. pies, and *D. cheese*—made somewhat in the manner of fig-cake—are well-known English luxuries. The name is a corruption of *Damascene*, from Damascus.—The MOUNTAIN D. or BITTER D. of the West Indies is the Simaruba (q. v.).

**DAMUGGO'**, a large and populous town of Upper Guinea, Africa, situated on the left bank of the Niger, in lat. 7° N., long. 7° 50′ E. The houses, built of mud, and supported by wooden props, are circular in shape. The town is dirty, and has a miserable appearance. The population, the number of which has not been ascertained with any degree of accuracy, support themselves by trade and the cultivation of the soil.

**DA'NA**, RICHARD HENRY, an American poet and novelist, was born in 1787 at Cambridge, Massachusetts. After leaving Harvard College, at which he had remained three years, he adopted law as a profession, but eventually renounced it, and applied himself to literature. In 1817, he became a contributor to the *North American Review*, his connection with this periodical continuing for three years, during a portion of which time he assisted in its editorship. The *Idle Man*, which contains many of his best prose efforts, was commenced in 1821, but proving a failure in a commercial point of view, was soon discontinued. Having at an earlier date published the *Dying Raven*, a poem of great merit, he came forward, in 1827, with the *Bucaneer*, and other poems. Upon these his reputation principally rests. In 1833, he published a volume of his previous writings, both prose and verse, and since that time has written little. D., in 1839—1840, delivered in Boston and New York a series of well-received lectures on Shakspeare.—RICHARD H. DANA, the son of D., is well known as the author of *Two Years before the Mast.*

**DA'NAË**, the daughter of Acrisius, king of Argos, and Ocaleia. According to the mythological narrative, an oracle had announced that she would one day give birth to a son, who should kill his grandfather. Acrisius, of course, felt extremely uncomfortable after this declaration, and took every precaution to keep D. a virgin. He shut her up in a dungeon, where, nevertheless, she was visited by Zeus in a shower of gold, and became, in consequence, the mother of Perseus. Acrisius put both the mother and child into a chest, and exposed them on the sea. The chest, however, drifted ashore on the island of Seriphos, and D. and her child were saved. D. remained in the island until Perseus had grown up and become a hero famous for his exploits. She afterwards accompanied him to Argos. On his arrival, Acrisius fled, but was subsequently slain by Perseus at Larissa.

**DA'NAÜS**, a mythical personage, the son of Belus and Anchinoë, brother of Ægyptus, and originally ruler of Libya. Thinking his life in danger from the machinations of his brother, he fled to Argos, accompanied by his fifty daughters, known as the DANAIDES, where he was chosen king, after the bànishment of Gelanor, the last of the Inachidæ. The fifty sons of Ægyptus followed him, and under the pretence of friendship, sought the hand of his daughters in marriage. D. consented, but on the bridal-night he gave his daughters each a dagger, and urged them to murder their bridegrooms in revenge for the treatment he had received from Ægyptus. All did so, except one, Hypermnestra, who allowed her betrothed, Lynceus, to escape. D., as may naturally be supposed, found great difficulty in obtaining new husbands for his daughters; and in order to get them off his hands, instituted games, where they were given as rewards to the victors, although they could scarcely have been considered very tempting prizes. As a punishment for their crime, they were compelled, in the under-world, to pour water for ever into a vessel full of holes. So runs the myth; but Strabo mentions an old tradition, which declares D. and his fifty daughters to have provided Argos with water, which is probably the origin of the scene in Hades. Greek art, of course, represents the Danaides in conformity with the popular myth. The tomb of D., in the Agora of Argos, was shewn as late as the time of Pausanias.

**DA'NBY, FRANCIS**, A.R.A., a painter, born about six miles from Wexford, in Ireland, 16th November 1793. He was educated in the school of the Society of Arts, Dublin, and soon gave indications of superior artistic talent. His first attempts were sent to the Dublin Exhibition. After 1820, he took up his residence at Bristol, whence he sent to the Royal Academy, London, his 'Disappointed Love' (1821), 'Warriors of the Olden Time listening to the Song of their Minstrel' (1823), and 'Sunset at Sea after a Storm' (1824). In 1825, D. produced 'The Delivery of Israel out of Egypt;' in 1826, 'Christ Walking on the Sea;' in 1827, 'The Embarkation of Cleopatra on the Cydnus;' and in 1828—1829, 'An Attempt to Illustrate the Opening of the Seventh Seal,' 'The Passage of the Red Sea,' and 'The Deluge.' Circumstances now induced him to visit the continent, where he resided till 1841, during which interval he executed very few paintings. On his return, he took up his abode at Exmouth, where he has since lived. Among his later works, may be mentioned, 'A Morning at Rhodes' (1841), 'The Enchanted Island' (1841), 'The Contest of the Lyre and Pipe in the Valley of Tempe' (1842), 'The Tomb of Christ after the Resurrection,' 'Fiensford Lake (Norway)—a Sudden Storm passing off,' 'Caius Marius among the Ruins of Carthage' (1848), and 'The Departure of Ulysses from Ithaca' (1854).

**DANCE OF DEATH** (Lat. *Chorea Machabæorum*, Fr. *La Danse Macabre*), a name given to a certain class of allegorical representations, illustrative of the universal power of Death, and dating from the 14th century. When the introduction of Christianity first banished the ancient Germanic conception of a future state, a new description of death-mythology arose, partly out of biblical sources, partly out of the popular character itself, wherein the Last Enemy was represented under simple and majestic images, such as that of a husbandman watering the ground with blood, ploughing it with swords, rooting out weeds, plucking up flowers, or felling trees, sowing it with corpses; or of a monarch assembling his armies, making war, taking prisoners, inviting his subjects to a festival, or citing them to judgment. But with a gradual change in national manners came a change in the mode of treating the subject, and it was associated with everyday images, such as the confessional, chess-playing, and above all, with the adjuncts of a festival—viz., music and dancing. This tendency to familiarise the theme increased during the confusion and turmoil of the 14th c., when the national mind alternated between fits of devotion and licence, or blent both elements in satire and humour. Such a mood as this naturally occupied itself with personifying Death, and adopted by preference the most startling and grotesque images it could find—that of a musician playing to dancing-men, or a dancer leading them on; and as the dance and the drama were then intimately connected, and employed on religious occasions, this particular idea soon assumed a dramatic form.

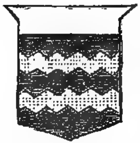
This drama was most simply constructed, consisting of short dialogues between Death and four-and-twenty or more followers, and was undoubtedly enacted in or near churches by religious orders in Germany during the 14th c., and at a rather later period in France. It would appear that the seven brothers, whose martyrdom is recorded in the 7th chapter of the 2d Book of *Maccabees*, either played an important part in the drama, or the first representation, which took place at Paris in the Cloister '*aux Innocents*,' fell upon their festival, and hence the origin of the ancient name, Chorea Machabæorum, or La Dànse Macabre. As early as 1400, the dramatic poem was imitated in Spain, and appears there in 79 strophes of 8 lines each (*La Dança General de los Muertos*), but it did not spread; while the French, having a love for pictorial representation, very early affixed an illustration to each strophe, and in 1425 painted the whole series on the churchyard-wall of the Cloister of the Innocents, where the Dance of Death was habitually enacted. We find the subject treated in painting, sculpture, and tapestry, in the churches of Anjou, Amiens, Angers, Rouen, to say nothing of the numerous wood-cuts and accompanying letter-press which succeeded the invention of printing. From Paris, both poem and pictures were transplanted to London (1430), Salisbury (about 1460), Wortley Hall in Gloucestershire, Hexham, &c.

But nowhere was the subject so variously and strikingly treated as in Germany. A picture in one of the chapels of the Marienkirche, at Lübeck, still, in spite of repeated re-paintings, bearing the unmistakable impress of the 14th c., exhibits the very simplest form of the drama, and has some genuine Low-German verses attached to it. Here we see 24 figures, partly clerical, partly lay, arranged in a descending scale, from the pope himself down to a little child, and between each of them a dancing-figure of Death, not in the form of a skeleton, but a shrivelled corpse, the whole being linked in one chain, and dancing to the music of another Death. This representation is almost the same as a very ancient one at La Chaise-Dieu, in Auvergne, and points to the identity of the original dramatic spectacle in both countries.

The celebrated Dance of Death on the cloister walls of the Klingenthal, a convent in Basel, though painted probably not later than 1312, exhibited a departure from the simplest form—the number of persons exceeding the original 24, and the chain being broken up into separate couples. But both alike are only to be regarded as scenes from a drama, and cannot, therefore, be justly compared with a contemporary Italian painting, the 'Triumph of Death,' by Andrea Orcagna. And the acted drama enduring till the 15th c., we find that while there were varieties in the paintings, the poem, which was the most important feature, remained almost unchanged.

About the middle of the 15th c., however, the drama being altogether laid aside, the pictures became the main point of interest, the verses merely subsidiary. Accordingly, we find from this time the same pictures repeated in different places, with different verses, or no verses at all, till at length both verses and pictures entirely change their original character. The Dance of Death being transferred from the quiet convent walls into public places, gave a new impulse to popular art. Duke George of Saxony had, in 1534, the front of his Dresden castle ornamented with a life-size bas-relief of the subject, and other representations are to be found at Strasburg and Bern. There was a Dance of Death painted round the cloister of old St Paul's in London, in the reign of Henry VI.; and there is a sculptured one at Rouen, in the cemetery of St Maclou. But Holbein has the credit of availing himself most effectively of the original design, and giving it a new and more artistic character. Departing from the idea of a dance, he illustrated the subject by 53 distinct sketches for engravings, which he called 'Imagines Mortis.' The originals of these are at St Petersburg, and impressions of them have been frequently repeated under different names.

We may cite as authorities on this subject, Peignot's *Recherches sur les Danses des Morts* (Dijon and Paris, 1826); Massman's *Baseln Todtentänze* (Stuttgart, 1847), and Douce's *The Dance of Death* (Lond. 1833).


Dancette.

**DANCETTE**, one of the lines of partition in Heraldry, which differs from Indented (q. v.) only in the greater size of the notches. The indentations where the division is *per fess* dancette, never exceed three in number.

**DANCING** may be defined in a general way as the expression of inward feelings by means of rhythmical movements of the body, especially of the lower limbs, usually accompanied by music. Dancing may almost be said to be as old as the world, and prevails in rude as well as in civilised nations. Children, and also the lower animals, dance and gambol as by instinct. Our early records, sacred and profane, make mention of dancing, and in most of the ancient nations it was a constituent part of their religious rites and ceremonies. They danced before their altars and round the statues of their gods. The Greek chorus, 'in the oldest times, consisted of the whole population of the city, who met in the public place (*choros*, the market-place), to offer up thanksgivings to their country's god, by singing hymns and performing corresponding dances.' The Jewish records make abundant mention of dancing. Moses and Miriam danced to their song of triumph, when the Israelites passed through the Red Sea as on dry land; David danced before the Ark. It is certain that the primitive Christians danced at their religious meetings, though we have no mention of this in the New Testament. The Greeks made the art of dancing into a system expressive of all the different passions, the dance of the Eumenides, or Furies, especially, creating such terror, that the spectators seemed to see these dreaded deities about to execute Heaven's vengeance on earth. The most eminent Greek sculptors did not disdain to study the attitudes of the public dancers for their art of imitating the passions. In Homer, we read of dancing and music at entertainments. Aristotle ranks dancing with poetry, and says, in his *Poetics*, that there are dancers who, by rhythm applied to gesture, express manners, passions, and actions. In Pindar, Apollo is called the dancer; and Jupiter himself, in a Greek line, is represented as in the act of dancing. The Spartans had a law obliging parents to exercise their children in dancing from the age of five. This was done in the public place, to train them for the armed-dance. They were led by grown men, and all sang hymns and songs as they danced. The young men danced the Pyrrhic dance, in four parts, expressive of overtaking an enemy and of a mock-fight.

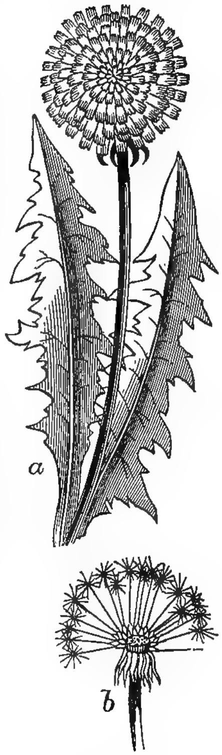
Dancing, as an entertainment in private society, was performed in ancient times mostly by professional dancers, and not by the company themselves. Among the sedate Romans, in fact, it was considered disgraceful for a free citizen to dance, except in connection with religion. Having professional dancers at entertainments is still the practice among Eastern nations. In Egypt there are dancing and singing girls, called Almé, who improvise verses as in Italy. They are highly educated, and no festival takes place without them. They are placed in a rostrum, and sing during the repast; then descend, and form dances that have no resemblance to ours. All over India there are Nautch girls or Bayaderes (q. v.), who dance at festivals and solemnities.

It is among savage nations that the passion for dancing is most strongly manifested. Their dances are mostly associated with religion and war; and the performers work themselves into a state of frantic excitement—a kind of mechanical intoxication. As civilisation advances, dancing—amateur dancing, at least—assumes a more and more subdued character. As a social amusement and a healthful exercise, dancing has much to recommend it; the chief drawbacks are the ill-ventilated and overheated rooms in which it is generally performed. By many, it is unfavourably regarded in a moral point of view; but this seems a relic of that outburst of puritanism that characterised the 17th c., and which saw sin in every joyous excitement. Dancing is doubtless liable to abuse, but not more so than most other forms of social intercourse. Connected with the subject of dancing, see ACROBATS, BALLET, PANTOMIME, COUNTRY-DANCE, QUADRILLE, POLKA, &c.

**DANCING MA'NIA**, a form of epidemic disorder allied to hysteria (q. v.), and evidently the result of imitative emotions acting upon susceptible subjects, under the influence of a craving for sympathy or notoriety. There is little doubt that imposture entered to a considerable extent into all the epidemic forms of the dancing mania, which indeed were usually attended and followed by consequences that shewed but too clearly the presence of impure motives; but there is also evidence that in many cases the convulsive movements were really beyond the control of the will, whatever may have been the original character of the motives that prompted them. Epidemics of this sort were common in Germany during the middle ages, and are formally described as early as the 14th c.; in Italy, a somewhat similar disease was ascribed to the bite of a spider called the Tarantula (see TARANTISM); and similar convulsive affections have been witnessed in Abyssinia, India, and even in comparatively modern times and in the most civilised countries in Europe, under the influence of strong popular excitement, especially connected with religious demonstrations. But the true dancing mania of the middle ages had its theatre chiefly in the crowded cities of Germany.

In July 1374, there appeared at Aix-la-Chapelle assemblies of men and women, who, excited by the wild and frantic, partly heathenish, celebration of the festival of St John, began to dance on the streets, screaming and foaming like persons possessed. The attacks of this mania were various in form, according to mental, local, or religious conditions. The dancers, losing all control over their movements, continued dancing in wild delirium, till they fell in extreme exhaustion, and groaned as in the agonies of death; some dashed out their brains against walls. When dancing, they were insensible to external impressions, but haunted by visions, such as of being immersed in a sea of blood, which obliged them to leap so high, or of seeing the heavens open, and the Saviour enthroned with the Virgin Mary. The frenzy spread over many of the towns of the Low Countries. Troops of dancers, inflamed by intoxicating music, and followed by crowds, who caught the mental infection, went from place to place, taking possession of the religious houses, and pouring forth imprecations against the priests. The mania spread to Cologne, Metz, and Strasbourg, giving rise to many disorders, impostures, and profligacy. These countries were generally in a miserable condition; and arbitrary rule, corruption of morals, insecurity of property, and low priestcraft, prepared the wretched people, debilitated by disease and bad food, to seek relief in the intoxication of an artificial delirium. Exorcism had been found an efficacious remedy at the commencement of the outbreak; and in the beginning of the 16th c., Paracelsus, that great reformer of medicine, applied immersion in cold water with great success. At the beginning of the 17th c., the St Vitus's Dance, as the affection was called (see VITUS, ST), was already on the decline; and we now hear of it only in single cases as a sort of nervous affection. A detailed account of the phenomenon is given in Hecker's *Epidemics of the Middle Ages*. See CONVULSIONAIRES, JUMPERS.

**DANDELI'ON** (*Leontodon taraxacum*, or *Taraxacum officinale*), a plant of the natural order *Compositæ*, sub-order *Cichoraceæ*, common throughout Britain and the whole of Europe, in pastures and by waysides, and now also so perfectly naturalised in many parts of North America, as to be there one of the most familiar spring-flowers. The names D. and Leontodon (Fr. and Gr. lion's-tooth) both have reference to the form of the leaves. The whole plant abounds in a milky juice, containing a peculiar crystalline principle called *Taraxacin*; has a bitter taste; and is tonic, deobstruent, and diuretic. D. root is employed in medicine, in the form of infusion, decoction, and extract, chiefly in diseases of the liver and chronic affections of the digestive organs. It contains resin, inulin, sugar, &c. When roasted and ground, it is also sometimes used as a substitute for coffee. *D. coffee*, however, is usually a mixture of ordinary coffee and the powder or extract of D. root; and *D. chocolate* is composed of one part of common chocolate and four parts of the powder of D. root. The young leaves, when blanched, are a good salad, resembling lettuce or endive.



Dandelion:
*a*, leaves, scape, and head of flowers; *b*, head of ripe fruit with pappus.

**DA'NDOLO**, a famous Venetian family, which has given four doges to the republic. The most illustrious of its members was Enrico D., born about 1110 or 1115 A.D. Eminent in learning, eloquence, and knowledge of affairs, he ascended from one step to another, until, in 1173, he was sent as ambassador to Constantinople, and in 1192 was elected doge. In this latter capacity, he extended the bounds of the republic in Istria and Dalmatia, defeated the Pisans, and (in 1201) marched at the head of the Crusaders. He subdued Trieste and Zara, the coasts of Albania, the Ionian Islands, and Constantinople (17th July 1203). When the Emperor Alexius, who had been raised to the throne by the exertions of D., was murdered by his own subjects, D. laid siege to Constantinople, and took it by storm, 13th April 1204. He then established there the empire of the Latins, and caused Count Baldwin of Flanders to be chosen emperor. By the treaty of partition which he concluded with the other leaders of the crusade, Venice obtained possession of some of the islands of the Ionian Sea, and of the Archipelago, several harbours and tracts of land on the Hellespont, in Phrygia, the Morea, and Epirus, an entire quarter of Constantinople, and also, by purchase, the island of Candia. Soon after this, D. died (June 1, 1205), in Constantinople, and was buried in the Church of St Sophia. His monument was destroyed by the Turks at the taking of Constantinople in 1453.

**DA'NEBROG, ORDER OF**, the second of the Danish orders, was instituted by King Waldemar in 1219. The word *brog* in old Danish signifies 'cloth,' and thus D. is equivalent to the cloth or banner of the Danes. The order is a sort of glorification of the old national flag of Denmark, which long floated, like the oriflamme of France, at the head of the army. It is meant to recompense services rendered to the state, whether civil or military, and irrespective of age or rank. The decoration of the order consists in a cross of gold *pattée*, enamelled with white, and suspended by a white ribbon, embroidered with red.

**DA'NEGELT**, or **DANEGOLD**, a tribute, first of 1*s*., and afterwards of 2*s*., levied on every hide of land by the Anglo-Saxons, for the purpose of meeting the outlay requisite for defending the country against the Danes. The tax was continued after the Conquest, as one of the rights of the crown, till the time of Stephen.

**DA'NE-LAGE**, or **DANE-LAW**. After the overthrow of the Danes under Guthrun at Ethandune by King Alfred (878 A. D.), a treaty was concluded between the two, in virtue of which the entire kingdom of Wessex, from Somerset to Kent, was evacuated by the Danes, who were, however, allowed to retain the greater part of the east coast of England, including the whole of Northumbria. This district was called Danelagh or Dane-law (which name it retained down to the Norman Conquest), because the inhabitants were ruled by Danish and not by English law.

**DA'NÏEL**, a Hebrew prophet, who flourished about 600 B.C. He was a contemporary of Ezekiel, and was carried captive to Babylon in the fourth year of Jehoiakim. He was one of the youths selected to be brought up for future service at the court of the conqueror, and received instruction in all the learning of the Chaldæans. His skill in the interpretation of dreams procured for him the royal favour. He rose to be governor of the province of Babylon under Nebuchadnezzar; and under Darius, the Mede, to be first president of the whole Medo-Persian empire, a dignity only inferior to that of Darius himself. The time and the place of his death are alike unknown. He was alive, however, in the first year of the reign of Cyrus, but did not return to Judæa with his countrymen on their release from captivity. Epiphanius and others affirm that he died at Babylon; but the common tradition is, that he expired at Susa or Shusan in Persia, when upwards of ninety years of age; and at the present day, a tomb bearing his name is the only standing building among the ruins of that ancient city. D. was the only one of the Hebrew prophets who enjoyed a high degree of worldly prosperity. Ezekiel mentions him as a model of wisdom and piety.—The Book of D. consists partly of historical notices of D., and partly of visions and prophecies, some of which are written in Chaldee. The genuineness of the book, in its present form, has been much disputed in recent times.

**DANIEL**, SAMUEL, an English poet, was the son of a music-master, and was born in 1562 near Taunton, in Somersetshire; entered Magdalen Hall, Oxford, in 1579, but quitted the university without taking a degree. For some time he acted as tutor to Anne Clifford, daughter of the Earl of Cumberland. In 1603, he was appointed master of the queen's revels, and inspector of the plays to be represented by the juvenile performers. Subsequently, he held other offices about the royal household. Towards the close of his life, he retired to a farm which he possessed at Beckington, in his native county, where he died, October 14, 1619. D. is an elegant, if not a great poet. His writings are pervaded by a moral thoughtfulness and purity of taste which are very remarkable, but lack that vital energy of movement and memorableness of expression which result from genuine inspiration. The 'well-languaged Daniel' is therefore not the most interesting of the Elizabethans, although his style is quite modern. His works include sonnets, epistles, masks, and dramas; but his chief production is a poem in eight books, entitled a *History of the Civil Wars between York and Lancaster.*

**DA'NÏELL**, JOHN FREDERICK, D.C.L., a distinguished English savant, was born in London, March 12, 1790. He was a pupil of Professor Brande, along with whom he made several scientific tours; was elected a fellow of the Royal Society in 1814, and in 1816 started, in connection with Professor Brande, the *Quarterly Journal of Science and Art*. From this period, D. devoted almost the whole of his time to the subjects of chemistry and meteorology. In 1823, he published his *Meteorological Essays*, which is still the standard-work on meteorology; and in 1824 the Horticultural Society awarded him their silver medal for his *Essay on Artificial Climate*. In 1831, he was appointed Professor of Chemistry in King's College, London; and in 1839 published his *Introduction to Chemical Philosophy*. In 1843, he received the degree of D.C.L. from the university of Oxford. He also enjoyed the great honour of being the only person who ever obtained all the three medals in the gift of the Royal Society. Besides his professorship in King's College, D. also held the post of Lecturer at Addiscombe, and of Examiner in Chemistry to the university of London. He died March 13, 1845. D.'s *Meteorological Essays* was the first attempt to account, in a truly philosophical manner, for the known phenomena of the atmosphere. Besides the works mentioned, D. wrote a large number of interesting and valuable papers for the Royal Society. For an account of his new hygrometer, see HYGROMETER.

**DANISH LANGUAGE AND LITERATURE.** The Danish language, which, with slight modifications, is common to the three Scandinavian kingdoms, is a branch of the ancient Gothic, and has been retained almost in its original form in Iceland. The oldest memorials of the Danish are codes of laws, as the *Skaanske Lov*, and the old and new *Sjællandske Lov*, promulgated by Valdemar the Great in 1162 and 1171; but these, no less than the writings of Harpestreng, canon of Roeskilde (1244), already shew marked deviations from the Icelandic, in consequence of the intermixture of the Anglo-Saxon, English, and Norman elements, due to the Danish occupation of England, and the immigration of monks and artisans into Denmark from Britain. The influence of the English dialect was again modified towards the close of the 12th c. by the influx of Germans into the country. Saxo Grammaticus, the father of Danish history, who died in 1204, wrote, like almost all his ecclesiastical brethren at that day, in Latin, as did also his contemporary, the knight Svend Aagesen. The Danish *Kæmpeviser* are the richest poetical remains of the folks-lore of the middle ages in Europe, and consist—1. Of narratives and songs of giants, demigods, and other supernatural creatures of the Scandinavian mythology; 2. Of romantic songs and tales connected with these mythical beings; and, 3. Of historical verses, referring to a later period. The names of the writers are unknown, and these compositions seem rather to be the expression of the entire people, than the production of individual poets. Many have, from time immemorial, been associated with certain national melodies, which have secured them a permanent place in the hearts of the people, whose disposition leads them to dwell with fondness on the memory of by-gone times and events, and to seek in the glory of the past a compensation for the national humiliation and reverses of the present. The first printed collection of the Kæmpeviser is due to the royal historiographer, Vedel, and appeared at Ribe, 1592; another edition (Copenh. 1695) by Peter Syv found its way to almost every peasant's cottage; but the most complete of any is probably that by Nyerup and Rabek, in 5 vols. (Copenh. 1810—1814). After the Reformation, the national literature was comparatively neglected, for the composition of poor theological treatises and bald versions of the Psalms. Among the best of the writers in this department we may instance Christian Pedersen (born 1480), who, after having made a metrical version of the ancient national chronicles, devoted himself to the diffusion of the Lutheran faith, and made Danish translations of the New Testament, and the reformer, Hans Taussen (born 1494), who composed catechisms, and translated the Pentateuch into Danish. The Danish language acquired stability and new life by the translation of the whole Bible, which, by order of King Christian III., was effected in 1550 by Palladius and other professors of the university. The close of the 16th c. was memorable for the many admirable writers on history which it produced in Denmark. Among those who edited and annotated the ancient Danish and Icelandic historical chronicles, we may mention Peder Claussen, A. S. Vedel, and Axil Hvitfeldt, whose respective works supply invaluable materials to the historical inquirer. These men were contemporaries of the great astronomer, Tycho Brahé, and, like him, experienced the caprices of court-favour. The 17th c. shews a large number of able writers, among whom were Longomontanus, the pupil of Tycho Brahé; the family of Bartholin, numbering seventeen in three generations, who were all known for the ability of their writings on medical, philosophical, and mathematical subjects in Latin, German, and Danish; the family of the Pontoppidans, eleven in number, all of whom have left memorials of their proficiency in philology and history, and of their acquaintance with the theology and natural history of the times; Arreboe, the father of Danish poetry, who wrote on sacred subjects, and in his principal work, *Hexameron*, described in epic verse the events of the first six days of creation; Steno, the anatomist, and the lyrical poet, T. Kingo. A new era began with the genial and versatile Ludvig Holberg (born 1684), who wrote in Latin, French, German, and Danish, and has left very numerous works on history, biography, and topography, but whose fame among his countrymen will ever rest on his inimitable comedies, farces, and satirical compositions. His genius and his writings gave an impetus to the cultivation of the Danish language, which not all the studied neglect of the court-party, and their persistence in the use of German, could check. The 18th c. produced many good historical critics—as, for instance, Torfæus, Langebek, Schöning, and Suhm, Magnæus, the Icelandic scholar, Thorlacius, and Thorkelin, learned in ancient northern lore, and Rosenvinge, the jurist. Among the epic and dramatic poets of that age, Ewald stands foremost, whose national lyrics evince true poetic genius. The close of the century was, however, unfavourable to mental development and freedom of thought; and the best writers, as in the case of Malte Brunn and the poet Heiberg, were either compelled to leave the country, or to abstain from giving expression to their opinions. Among the more recent writers, we may instance the poet Oehlenschläger—whose national tragedies and lyrical legends of Scandinavian mythology have rekindled all the long slumbering fire of Danish patriotism—Baggesen, Winther, Hauch, F. P. Müller, Heiberg, Hertz, H. C. Andersen, Rosenhoff, Holst, and Overskou. Ingemann, who stands first as a writer of historical novels, has also written good lyrics, and his subjects have generally been taken from the national history. Short tales or novellettes would seem, however, to be more congenial to the taste of the Danes, and most of their best writers of fiction have adopted this form—as, for instance, Blicher, Heiberg, Trane, Andersen, Winther, Carit Etlar, &c. The names of Oersted, Schouw, Forchhammer, Rask, Finn Magnussen, Worsaa, Grundtvig, Petersen, and Eschricht, sufficiently attest the stand that the physical sciences, philology and archæology, have attained in Denmark in the present day. Thorwaldsen, by the gift of his works to the nation, has created a taste and appreciation for sculpture and the arts generally among his countrymen, to which they were previously strangers, and has thus given a new direction to the mental culture of the Danes.

The Danish language is peculiarly soft, from the great number (ten) of distinct vowel-sounds which it contains, the absence of gutturals, and the softening of all the consonants. It may be said to bear the same relation to the ancient tongue, the *Norræna* or *Donsk Tunga*, that Italian does to Latin, force and precise inflections having been sacrificed for melody and simplicity.

**DANKALI′**, an independent state of Abyssinia, extending along the south-west border of the Red Sea, between lat. 13°—15° 30′ N., a range of mountains running almost parallel to the coast, and about 50 miles distant from it, forming its boundary inland. D. is a sterile territory, being almost quite destitute of water. The heat is excessive, often reaching 110° F. The inhabitants are composed of various Arab tribes, and are indolent, treacherous, and cruel. They number about 70,000.

**DA′NNECKER, Joh. Heinr. von**, a German sculptor, was born at Waldenbuch, in the district of Stuttgart, 15th October 1758. His parents were in the humblest circumstances; but through the favour of the Duke of Würtemberg, he received a good education at the Military Academy at Ludwigsburg. His artistic talents were rapidly developed. In 1780, he obtained the prize for the best model of 'Milo of Croton destroyed by the Lion;' and in 1783 went to Paris, where he studied for two years under Pajou; after which, he proceeded to Rome, where he met with Goethe, Herder, and Canova, to the last of whom he was indebted for much valuable instruction in his profession. At Rome, D. remained till 1790. Here he executed in marble his statues of 'Ceres' and 'Bacchus.' On his return to Germany, the Duke of Würtemberg appointed him Professor of Sculpture in the Academy at Stuttgart, in which city he resided till his death, 8th December 1841. D. was undoubtedly one of the best of modern sculptors. His forte lay in expressing individual characteristics, in which respect he has not been surpassed. This gives a great value to his busts of distinguished persons, such as Schiller, Lavater, Gluck, and the kings Frederick and William of Würtemberg. His perceptions of the beautiful and the delicate, especially in the female form, are also considered by his countrymen to be more exquisite and true than those of Canova himself. His earlier works are chiefly pagan in their subjects, while his later ones are Christian, and are pervaded by a pensive idealism. Of the former, besides those already mentioned, the principal are 'Sappho,' 'Love,' 'Psyche,' and 'Ariadne as the Bride of Bacchus riding on a Leopard (at Frankfurt);' of the latter, 'Christ,' 'John the Baptist,' and 'Faith.'

**DA′NTÉ** (properly, Durante) **ALIGHIE′RI**, one of the greatest poets of all time, and incomparably the greatest among the Italians, was born in

Florence in 1265. The outward circumstances and fortunes of his life are involved for the most part in great uncertainty. His family was, by his own account, one of the most illustrious in the city. His father dying while D. was young, his education devolved upon his mother, Bella. In this duty, in which she displayed great fidelity and judgment, she seems to have been counselled and aided by the great statesman, scholar, and poet, Brunetto Latini. The elements of knowledge D. probably acquired in Florence; in riper years, he studied philosophy at Bologna and Padua. After his banishment, he pursued theology for a time at Paris, and, if Boccaccio were to be believed, even visited England. His studies, however, did not prevent him from discharging the public duties of a citizen. He fought in the successful battle with the Aretines at Campaldino in 1289, and was present at the taking of the fortress of Caprona, 1290. What civil offices he first held, we do not know, but it is certain that he was sent on several embassies, and at last, in 1300, rose to the highest dignity of the city, being chosen one of the Priori for two months, an office which was the source of his subsequent unhappy fortunes. Florence, on the whole, belonged to the party of the Guelphs (q. v.), but was divided into the two factions of the Neri and Bianchi (the *blacks* and *whites*). The Neri were the unconditional adherents of the pope, and this of course gave to the other faction a more Ghibelline leaning. See GUELPHS and GHIBELLINES. A tumult in the city, occasioned by the heads of the ultra-Guelphic or *black* party, caused their temporary expulsion from Florence. They hurried to Rome, to lay their complaints before his Holiness. D., who belonged to the Bianchi, was sent by his party to Rome, to counteract their machinations; but Boniface VIII., in concert with the Neri, got Charles of Valois, brother of Philip IV. of France, to come to Florence and restore peace under the title of peace-maker. This explains the deadly enmity of D. to Boniface. The peace established by Charles of Valois consisted in recalling the banished leaders of the Neri, in giving up the houses and property of the Bianchi to be plundered, and banishing many of them, and among others Dante. D. never entered his native city again, and his whole subsequent life was unsettled, spent in various places, and under various protectors, at Arezzo, Verona, Padua, &c. In 1304, the Bianchi made a final attempt to return to Florence by force of arms, which failed; and it was probably on this occasion that D. went to Paris. The march of Henry VII. to Rome in 1310 recalled him to Italy, and he endeavoured, by addressing ardent letters to the Italian princes, to promote the cause of the empire, which had now become his own. It was probably with this view and at this time, that his work *De Monarchia* was written. The unsuccessful siege of Florence, and the death of the emperor, which followed in 1313, annihilated the last hopes of D., and he spent the closing years of his life at Ravenna, under the protection of Guido Novello da Polenta. He went on a mission for this prince to Venice, returned sick, and died on the 14th September 1321.

As not unfrequently happens with distinguished men, an accidental circumstance in D.'s early youth had made an indelible impression on the soul of the poet, and, as he himself expresses it, awaked in him a 'new life.' At a family festivity, he had seen Beatrice Portinaci, then eight years old, the daughter of a rich citizen, and the love that sprang up in the heart of the nine years' old boy became the fountain of the poetical inspiration of his life. How pure, chaste, and tender this love was, is testified by the *Vita Nuova*, his first work, which appeared about 1300. It is a collection of poems or canzoni, bearing upon this youthful love, and along with each piece is given a history of its origin and a minute analysis. The best edition of this collection is that prepared by the Marquis Trivulzio (Mil. 1827). Beatrice married a nobleman, Simone de Bardi, and died young about 1290. D. himself afterwards married a lady named Gemma, of the powerful House of Donati.

His immortal work, the *Divina Commedia*, depicts a vision, in which the poet is conducted first by Virgil, the representative of human reason, through hell and purgatory; and then by Beatrice, the representative of revelation; and finally by St Bernard, through the several heavens, where he beholds the triune God. The name *Commedia* was given to the work by the poet himself—because, beginning with the horrible, it ends cheerfully; and because, in respect of style, it is lowly, being written in the vulgar tongue. The epithet *Divina* was added by the admiration of after-times. Hell is represented in the poem as a funnel-shaped hollow, formed of gradually contracting circles, the lowest and narrowest of which is at the earth's centre. Purgatory is a mountain rising solitary from the ocean on that side of the earth that is opposite to us; it is divided into terraces, and its top is the terrestrial paradise, the first abode of man. From this, the poet ascends through the seven planetary heavens, the heaven of the fixed stars, and the 'primum mobile,' to the empyrean, or fixed seat of God. In all parts of the regions thus traversed, there arise conversations with noted personages, for the most part recently deceased. At one time, the reader is filled with the deepest sorrow, at another, with horror and aversion; or the deepest questions of the then philosophy and theology are discussed and solved; and the social and moral condition of Italy, with the corruptions of church and state, are depicted with a noble indignation.

Fifty-two years after the poet's death, the republic of Florence, at the instigation of Boccaccio, set apart an annual sum for public lectures to explain the *Divine Comedy* to the people in one of the churches, and Boccaccio himself was appointed first lecturer. The example was imitated in several other places of Italy. The works of these men are among the earliest commentaries on D. that we possess. The number of editions of the work amounts by this time to about 300. Only a few, in addition to the commentaries above mentioned, deserve notice. They are: that printed at Fuligno in 1472—the earliest of all; the Nidobeatine edition at Milan (1478); the first Aldine edition (1502); the first Cruscan edition (1695); that of Volpi (1727); of Venturi (1732); of Lombardi (1791), and with additions and illustrations in 1815, 1821, and 1822; of Dionisi (1795); of Ugo Foscolo (Lond. 1842—1843). A reprint of the Fuligno edition above mentioned, together with those printed at Jesi (1472), at Mantua (1472), and at Naples by Francisco del Tuppo (about 1478), appeared at London, in 1858, under the superintendence of Mr Panizzi, and at the expense of Lord Vernon.

The *Divina Commedia* has been translated into almost all European languages. Two translations of the whole into Latin have been printed, one by Carlo d'Aquino (1728), and lately by Piazza (1848). In French, there are a number of translations both in prose and verse. The earliest, by Grangier, in 1596, is still the nearest to the original in form, but none is good. The German translations are numerous, and such as no other modern language can equal in faithfulness. Kannegiesser has translated the whole in the measure and rhyme of the original (4th edition, Leip. 1843); Prince John of Saxony's translation is said by some to be the best.

The chief English translations are Boyd's (1785) and Cary's (1814), in blank verse; Wright's (1833), in triple rhymes; Cayley's, in the original ternary rhyme (the *Inferno*, 1851, the *Purgatory*, 1853, the *Paradiso* in 1854, with a volume of notes in 1855); Dr John Carlyle's, the *Inferno*, in prose, with a judicious commentary (1849); Fred. Pollock's, in blank verse (1854). Besides the *Divina Commedia*, the *Vita Nuova*, and the *De Monarchia*, D. wrote one or two other works.

**DA'NTON**, Georges-Jacques, was born at Arcis-sur-Aube, 28th October 1759. At the outbreak of the French Revolution, he was practising as an advocate in Paris, but did not enjoy much reputation, on account of his dissolute habits. The fierce half-savage nature of the man, however, immediately found a fitting sphere for its action in the chaos into which France then fell. Mirabeau quickly detected his genius, and hastened to attach D. to himself. President of the district of the Cordeliers, D. ruled it at his will. Along with Marat, and Camille Desmoulins, he instituted the Cordeliers' Club, an exaggerated copy of that of the Jacobins. It soon became the rallying-point of all the hotter revolutionists. There the tall brawny man, with harsh and daring countenance, terrible black brows, and a voice of enormous power, thundered against the aristocrats, till the passions of the populace rose into ungovernable fury. It was not, however, till after the flight of Louis that the political rôle of D. commenced. On the 17th July 1791, he and others assembled the people of Paris in the Champ-de-Mars, and goaded them on by furious declamation to sign a petition for the deposition of the king. Some time after, he became *procureur-substitut* for the city of Paris. The court, which found that it could not frighten D., now attempted to bribe him. It is not certain that he proved venal, but the evidence undoubtedly leaves a strong suspicion of his venality on the mind. Be that as it may, he soon broke off his secret intercourse with the royalist agents, and became more the implacable enemy of the monarchy than before. It was D. who excited to action the wild sanguinary rabble that, on the 10th of August 1792, stormed the Tuileries, and butchered the faithful Swiss. The reward of his fatal eloquence was the office of Minister of Justice, and here the gigantic personality of the man seemed to overshadow all the surrounding figures. He stood forth as the incarnate spirit of the Revolution, manifesting alike its heroic audacity in the presence of danger from without, and its maniacal terror in the presence of danger from within. The advance of the Prussians seemed for a moment to inspire France with a panic. On the 2d of September, D. mounted the tribune, and addressed the Legislative Assembly in a speech of tremendous power, probably the most effective delivered during the whole of the Revolution. It closed with these words regarding the enemies of France: 'Pour les vaincre, pour les atterrer, que faut-il? De l'audace, encore de l'audace et toujours de l'audace.' France quivered to its core with enthusiasm. 'In a few weeks, fourteen republican armies stood upon the field of battle, and repelled with unexampled bravery the aggressions of the allied forces.' But unhappily that 'audacity,' by which alone D. thought it possible for France to save herself, required for its perfection the immolation of the imprisoned royalists. On the very evening when D. spoke, the frightful September Massacres began. D. publicly thanked the assassins, 'not as the Minister of Justice, but as the Minister of the Revolution.' Elected by the city of Paris one of its deputies to the National Convention, he resigned his judicial function, and zealously hurried on the trial of the king. As a proof of his ferocious decision of character when pressed by difficulties, it is recorded that one of his friends having pointed out that the Convention could not *legally* try the king, 'You are right,' instantly replied Danton. 'So, we will not try him; *we will kill him!*' In the meantime, D. was sent on a mission to the army of the north, commanded by Dumourier, with whom he was soon on very close terms of intimacy—too much so, indeed, for the suspicious soul of his old friend Marat. The defection of Dumourier was the signal for Marat to give vent to his suspicions. It therefore became necessary for D. to throw himself again into the van of the revolutionary movement. On the 10th March 1793, he established the 'extraordinary criminal tribunal,' which was at liberty to make what arrests it pleased, and from whose deadly decisions there was no appeal. He also became president of the 'Committee of Public Safety.' D. now set himself to crush the Girondists, or moderate party, alleging, with singular candour, that 'in a revolution the authority ought to belong to the greatest scoundrels.' In this he was supported by Robespierre, now gliding into power swiftly and silently like a serpent. After he had effected his purpose, however, a species of remorse seems to have seized him. He objected to the institution of the guillotine. This trait of moderation lost him the favour of the Jacobins or Mountain party, whose murderous instincts led them to select Robespierre as a chief, on the permanence of whose cruelty more reliance might be placed. Several other indications of returning humanity lessened his influence still more, and at the close of 1793, D. felt that a crisis was approaching. A fruitless attempt was made to reconcile Robespierre and him. They had an interview, but parted on worse terms than ever. It was now a struggle for life between them; but D., sick of the Revolution, and conscious that it was rapidly becoming a *sham* (a thing which D., with all his faults, could not abide), gave himself up to a sort of reckless apathy, which enabled the sleepless Robespierre to ruin him. His friends endeavoured to rouse him. 'I would rather be guillotined than guillotine,' he answered. Blinded by the consciousness of his own inherent power, he also declared that his enemies 'would not dare' to lift their finger against him. But men of the stamp of Robespierre —though essentially cowards, and incapable of facing danger with honest straightforwardness—have a certain furtive audacity that emboldens them to attack a greater than themselves, if circumstances are favourable. So Robespierre sprang at D., and so the great anarch perished. On the night of the 30th March 1794, he was arrested, and brought before that Revolutionary Tribunal which he himself had established, summarily condemned, and, along with Camille Desmoulins and others, was guillotined on the 5th of April. He predicted the fate of Robespierre, calling him 'an infamous poltroon,' and immediately added, 'I was the only person who could have saved him.' D. was an atheist—not a calm, thoughtful dispassionate disbeliever in the existence of God, but one who, by his own vices, and the general godlessness of the times in which he lived, had been robbed of the spirit and power of faith in the Unseen. When formally interrogated regarding his name and dwelling, he replied: 'My dwelling-place will soon be annihilation, and my name will live in the Pantheon of history.'

**DA'NUBE**, the second in rank of European rivers, inferior only to the Volga, has its origin in the Brege and Brigach, two mountain-streams rising in the eastern part of the Black Forest, in Baden, at an elevation of 2850 feet above sea-level, in lat. 48° 6′ N., and in long. 8° 9′ E. The total length of the D. is about 1750 miles; the area which it drains is estimated at 250,000 square miles, comprising countries widely varying in climate and productions. The average fall of the D. is 18 inches per mile. At Ulm, it attains a breadth of 108 feet, and before its junction with the Sereth the mean breadth is 6000 feet, and the depth, which at Ulm is 6 feet, and at Passau 16, is here on an average 20 feet. The D. is joined in its course by sixty navigable rivers, and falls into the Black Sea, pouring into it a volume of water nearly equal to that of all the other rivers that empty themselves there. From its source, it flows in a north-easterly direction through Würtemberg and Bavaria. Passing Ulm, at which point the river becomes navigable for vessels of 100 tons, it receives from the south the Lech and the Iser, with some unimportant streams from the north; flows rapidly past Ingolstadt, and onwards to Regensburg (Ratisbon); then suddenly altering its course, it proceeds in a south-easterly direction, passing Straubing and Passau, where it enters the Austrian dominions. With little variation of course, the D. flows eastward from Passau to Presburg, receiving from the south the Inn and the Ens, and from the north the March or Morava, through a tract of country rich in minerals, well peopled, and highly cultivated. Near Linz, and also in the picturesque neighbourhood of Vienna, the waters of the D. frequently divide, and enclose large tracts of soil, forming islands, among which are the Great and Little Schütt, called also the 'Golden Gardens.' Hurrying past Presburg, the D. alters its course to south-east, and such is its velocity here, that barges can only navigate it downwards. Passing Pesth, and flowing directly south, it enters upon the Hungarian plain, a vast sandy and alluvial flat, in which it is continually forcing new channels and silting up old ones, sometimes sweeping away towns, or capriciously removing its waters to a distance of several miles from such as were formerly built upon its banks. Here it receives from the north the Waag and the Gran, while the Drave from the west adds considerably to its volume. After this accession, the river turns towards the east, and joined by the waters of the Theiss and Temes from the north, sweeps past Belgrade, forming the boundary between Servia and Hungary. Still flowing eastward, the D., leaving Orsova, passes the famous 'Iron Gate,' a broad plateau of rock 1400 yards wide, over which the water formerly rushed with an overpowering noise. This rapid, which was followed by a series of whirlpools, eddies, and shallow falls, formed an effectual bar to the upward progress of vessels, no craft drawing more than 2½ feet of water being able to pass it. Recently, however, the obstruction formed by the 'Iron Gate' has been to some extent removed by blasting, so that now vessels of eight, and even nine feet draught, can pass at certain seasons of the year, although the majority of vessels engaged on this part of the river draw no more than four feet of water. A few miles further on, it enters a plain, and proceeding uninterruptedly, forms the boundary between Wallachia and Bulgaria. From the Carpathians it receives the Schyl and the Aluta, and from Mount Balkan the Morava. Increased by these rivers and by numberless streams, it progresses through a district fertile indeed, but badly cultivated and thinly peopled, occasionally broadening like a sea, as at Hirsova, and encircling many islands. After being joined by the Sereth and the Pruth from the north, and after dividing into several branches forming deltoid islands, it flows eastward into the Black Sea. The principal mouth is the Sulina, by which the greater number of ships enter. The D., which is the chief natural highway for European commerce, is, throughout the greater part of its course, surrounded by picturesque and impressive scenery—at one time flanked with lofty mountains, again having on each side, and bordering on its brink, dense and far-extending forests, while along the border of Bulgaria, and onwards to its mouth, its broad surface is dotted with numerous and beautiful islands. In 1859, the navigation of the D. numbered upwards of 2000 vessels, having a burden of nearly 500,000 tons. The greater number of these vessels entered in ballast, and took out cargoes of corn, chiefly Indian corn. Wheat and other grain, horns, timber, hides, tallow, and salt, are also exported.

**DANU'BIAN PRINCIPA'LITIES.** See MOLDAVIA and WALLACHIA.

**DA'NZIG**, an important city and seaport of Prussia, in the province of West Prussia, is situated on the left bank of the western branch of the Vistula, about 3½ miles from its mouth in the Baltic, in lat. 54° 21′ N., long. 18° 40′ E. D. is an ancient place, having been in existence at least as early as the 10th c., and its possession was long an object of ambition to the Danes, Swedes, Pomeranians, and Teutonic knights, the last of whom obtained, and held it for a considerable period. In 1454, it became a free city under Poland, and remained so until 1793, when it fell under the dominion of Prussia, in whose hands, except during the years 1807—1814, when it existed as a separate dukedom under Napoleonic rule, it has since continued. D. is surrounded by ramparts and wet ditches, and is otherwise strongly fortified, and the garrison possesses the means of laying the surrounding country under water on three sides. The city is traversed by the Motlau and Radaune, tributaries of the Vistula, the former of which is deep enough to admit vessels of eight or nine feet draught up to the town. The principal port, however, is at Neufahrwasser, at the mouth of the Vistula, which river cannot be entered by large vessels on account of the sand-bars across it. Many of the streets of D. are narrow and crooked, but the principal street, intersecting it from east to west, abounds in fine specimens of antique architecture, and has altogether a most picturesque appearance. Among the most noteworthy buildings are the cathedral, a fine structure, commenced in 1343, but not finished until 1503, and possessed of a noble and widely celebrated picture of the 'Last Judgment' (the painter of which is unknown), the Church of St Catharine, Trinity Church, the Exchange, and Town-hall. D. was at one time a prominent member of the Hanseatic League, and is still one of the chief commercial cities of Northern Europe. To provide for its immense trade in grain, it has enormous granaries, capable of containing 500,000 quarters of corn, and built on an island—forming one of the parts of the town, where, in order to prevent fire, no person is permitted to live, nor lights allowed. The amount of grain exported from D. in 1857 was as follows:

| | Quarters. |
|---|---|
| Wheat, . . . . . . | 337,031 |
| Rye, . . . . . . . | 132,692 |
| Barley, . . . . | 25,370 |
| Oats, . . . . . . . | 8,716 |
| Pease and Beans, . . . . | 31,205 |
| Linseed, . . . . . | 6,534 |
| Rapeseed, . . . . . | 13,980 |

—the total value of which has been estimated at about £1,250,000. The value of timber exported from D. in the same year amounted to between £500,000 and £600,000. There are also some minor articles of export, as black-beer, amber, spirits, &c. Pop. 67,000.

**DAOUDNUGU'R**, a town of Bahar, in the sub-presidency of Bengal, stands on the right bank of the Sone. D. is about 90 miles to the east of Benares, being in lat. 25° 3′ N., and long. 84° 27′ E. It is a wretched-looking place, most of its thoroughfares being mere passages. It possesses, however, a considerable trade, manufacturing coarse fabrics both of wool and of cotton. Pop. estimated at 10,000.

**DAOU'RIA**, a country of Asia, partly in the Russian government of Irkutsk, and partly belonging to the Chinese territory of Mantchuria. Its limits are not exactly defined. The Daourian mountains, offsets of the Yablonoi mountains, traverse it from north-east to south-west, and separate it from the region of Lake Baikal. The mountains are fertile in minerals.

**DA'PHNÉ**, a magnificent grove and sanctuary in ancient times, near Antioch (q. v.). The grove was finely laid out in walks of cypress and bay trees, and as the chief resort of all the dissolute persons in the city, became the scene of the greatest debauchery. In the centre, surrounded by the luxuries of nature and art, glorious gardens, fountains, baths, colonnades, stood the temple of Apollo and Diana, which was invested with the privileges of an asylum, and became for centuries a place of heathen pilgrimage. The progress of Christianity gradually revived in the Antiochenes the purer instincts of virtue and decorum, and the grove was finally abandoned. Julian the Apostate, in his vain endeavour to resuscitate the lifeless corpse of paganism, visited D., and made the altars of the temple smoke once more with incense; but on his departure, they were again neglected, until one night the altars and the statues were discovered to be in flames. They were consumed to ashes; and so perished for ever the gods of Daphne.

D. owed its origin to Seleucus Nicator. He planted the grove, built the temple, and gave the place a mythological history in connection with the river Peneus and the nymph Daphne, who was here turned into a laurel or bay tree, whence the grove of D. received its name. Modern travellers are not agreed as to its site. Pococke and Richter decide in favour of *Beit-el-Maa*, about five miles from Antioch; while Forbiger and Kinneir consider Babylas the true position.

**DAPHNE**, a genus of plants of the natural order *Thymeleaceæ*, having a 4-cleft, funnel-shaped perianth, the throat of which is destitute of scales, eight stamens, and a one-seeded succulent fruit. All the species are shrubs or small trees, some having deciduous, and some having evergreen leaves, all of them possessing in all their parts a more or less considerable acridity, which in some is so great, that they are even caustic; and the berries are poisonous, whilst, however, the flowers of some are deliciously fragrant. To this genus belongs the MEZEREON (q. v.), well known both for the fragrance of its flowers and for its medicinal uses, naturalised in some places of England. The GAROU bush (*D. gnidium*), a native of the south of Europe, less hardy than the mezereon, has the same medicinal properties and uses, which is also in some measure the case with many other species. The only species certainly a native of Britain is the SPURGE LAUREL (*D. laureola*), an evergreen shrub, 3—4 feet high, with obovate-lanceolate leaves, which grow in tufts at the end of the branches, and give it a remarkable appearance. It grows well under the shade of trees. It is naturalised, rather than a native of Scotland. —*D. Japonica*, a species recently introduced from Japan, has exquisitely lemon-scented leaves. From the bark of some species of D., and of the most nearly allied genera, paper is made in different parts of the East, particularly *Nepaul paper* from that of *D. cannabina*. Slips of the inner bark are boiled in a lye of wood-ashes for half an hour till quite soft, are then reduced to a homogeneous pulp by beating with a wooden mallet in a mortar, churned with water into a thin paste, and poured through a coarse sieve upon a cloth stretched on a frame. The paper is subsequently polished by friction, with a shell or a piece of hard-wood, and is remarkable for its toughness, smoothness, and durability. Most of the paper used in Tibet is made from the bark of different species of D. and allied genera, particularly of *Edgeworthia Gardneri*, a beautiful shrub, with globes of waxy, cowslip-coloured, deliciously fragrant flowers, growing on the Himalaya, at an elevation of 6000—7000 feet. The bark of *Dais Madagascariensis* is also made into paper in Madagascar, and that of *Gnidia daphnoides* into ropes.

Daphne Mezereon.

**DA'PHNIA.** See WATER-FLEA.

**DA'PHNINE** is a bitter, astringent, crystalline substance present in different species of *Daphne*. It is analogous to asparagine. See ASPARAGUS.

**DARABGHE'RD**, or **DARA'B**, a town of Persia, in the province of Farsistan, lat. 29° N., long. 54° 30′ E. It is situated on a small river in the midst of an extensive plain, and is surrounded by lemon and orange groves. At one time, it was a place of great extent and importance, but most of it is now in ruins, and its population is not more than 15,000 or 20,000.

**D'ARBLAY**, MADAME. See BURNEY, DR CHARLES.

**DARBU'NG**, a mountain-torrent of Bussahir, Hindustan, with a course of only 27 miles, rises about 15,000 feet above the sea, in lat. 31° 57′ N., and long. 78° 25′ E., and loses itself in the Sutlej, the most easterly of the five rivers of the Punjab, in lat. 31° 43′ N., and long. 78° 35′ E. About 7 miles above the point of confluence—having already descended 6000 feet in 20 miles—the D. is crossed by a wooden bridge of 33 feet in length; and even somewhat further up, it is bordered by several villages. Its source has been described as a scene of terrific desolation, consisting of fields of snow and ice half-hid under stones and rubbish.

**DARDANE'LLES** (ancient *Hellespont*), a narrow channel separating Europe from Asia, and uniting the Sea of Marmora with the Grecian Archipelago. It extends from north-east to south-west, between lat. 40°—40° 30′ N., and long. 26° 10′—26° 40′ E., having a length of about 40 miles, and a breadth varying from less than 1 to 4 miles. From the Sea of Marmora, a strong current runs through the strait to the Archipelago. To prevent an attack on Constantinople from the Archipelago, the D. is strongly fortified on both sides. At the south-western opening of the strait there are two castles, one on the European, and the other on the Asiatic shore, called the new castles; and about 18 miles to the north-east are situated two other castles (the old castles), that on the European side marking the ancient Sestos, and the other, ancient Abydos. Between these points, the strait is defended by strong modern fortifications, mounting many hundreds of guns, some of them of immense calibre. The D. is celebrated in ancient history on account of Xerxes and Alexander having crossed it, the former in 480 B. C., to enter Europe; and the latter in 334 B. C., to enter Asia. The point at which Xerxes crossed, by two separate bridges, was in the neighbourhood of Abydos; and Alexander crossed at nearly the same place; and across here also young Leander nightly swam to visit Hero—a feat performed in modern times by Lord Byron for 'glory.'

**DARFU'R**, a country of Africa, east of Sudan, is generally said to be situated in lat. 10°—16° N., and in long. 26°—29° E.; but its limits are not very clearly defined. D. towards the south is hilly, the principal elevation being a mountainous ridge called Marrah, which traverses the country longitudinally, and is the source of numerous streams. Towards the north, D. is level, sandy, and almost destitute of water. During the rainy season, which commences in June, and continues till September, it exhibits a rich vegetation. The principal products are wheat, millet, rice, maize, and sesame. Tobacco, which is used by the natives in every form, abounds. Water-melons, also, are abundant during the rainy season. Among the fruits are tamarinds and dates. The minerals are chiefly copper and iron. The wealth of the inhabitants of D. consists chiefly in cattle, which are paid as tribute to the sovereign, all the commercial transactions of the country being conducted by barter. Horses and sheep are scarce. D. carries on a considerable trade with Egypt, Mecca, and the inland countries of Africa, bartering with the former slaves, ivory, ostrich-feathers, hides, drugs, copper, &c., for silks, cotton cloths, glass-wares, trinkets, spices, sword-blades, firearms, &c. The religion is Mohammedanism; the government, that of a despotic sovereign. Pop. estimated at 200,000. The capital, Kobbe, about lat. 14° 11′ N., long. 28° 8′ E., whence the caravans depart for foreign countries, is a straggling town of about 6000 inhabitants.

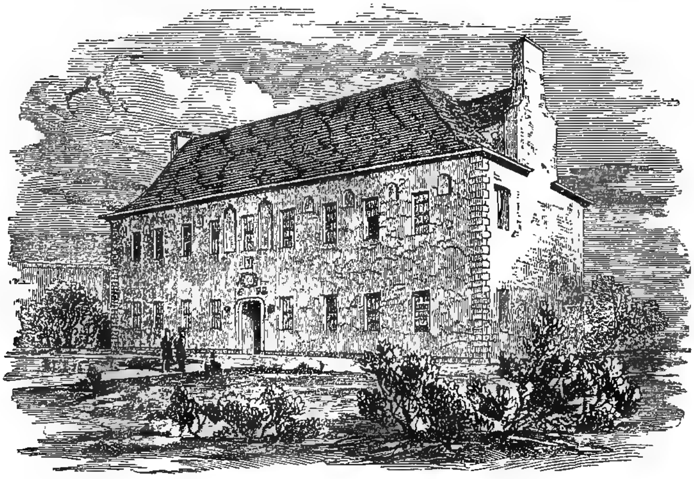
**DA'RGAN, William**, was born about the beginning of the present century in county Carlow, Ireland, where his father was a large farmer. D. received, when young, a good education, and after spending some time in the office of a surveyor, where he acquired a high reputation for integrity and assiduous industry, he went to England, and was employed under Telford, who was then constructing the Holyhead Road. Inspired perhaps by the example of that great engineer, D. now resolved to carve out a similar path for himself in his own country, and having returned to Ireland, obtained some small 'jobs,' the beginnings of a career crowned with the most splendid success, D. being now probably the first capitalist in Ireland. It was D. who contracted for the first railway ever executed in Ireland (the Dublin and Kingstown), and since then he has been connected with most of the great undertakings in that country, such as the making of railways, canals, tunnels, and embankments. D. is also an extensive holder of railway-stock, a steam-boat proprietor, flaxgrower, and farmer. He planned the Industrial Exhibition of Dublin (1853), with the view of developing more vigorously the material resources of his native country; and as a help towards its realisation, placed £20,000 in the hands of a working-committee. This sum was gradually increased to about £100,000. The Exhibition was opened on the 12th of May 1853, by the Lord-lieutenant; and was visited by the Queen and Prince Albert, when the honour of knighthood was offered to D., but was declined. In so far as the Industrial Exhibition was a *personal* speculation on the part of D., it was a failure, for he lost, it is said, £20,000 by it; but in every other respect it was highly gratifying to him, and to every genuine lover of his country. In a country so much afflicted as Ireland is with *sham*-patriots, it is pleasant and hopeful to remember that it has sons like William Dargan.

**DA'RÏEN**, a term of various application, indicating at once a province, a gulf, and an isthmus, on the common border of the two grand divisions of the New World.—1. The province—a portion, or rather, perhaps, a fragment, of the apparently crumbling republic of New Granada—seems to have been Spain's earliest possession on the western continent—the nucleus, in fact, of what, under the name of the Spanish Main, or *Terra Firma*, soon came to be distinguished alike from the islands on the one hand, and from Mexico and Peru on the other. The surface is mostly rugged and mountainous; and the climate, more particularly on the Atlantic side, is understood to be singularly moist and unhealthy.—2. The gulf, measuring 26 leagues from north to south, and averaging 9 from east to west, is the most southerly arm of the Caribbean Sea, penetrating as far down, between South America and Central America, as lat. 8° N. At its inner extremity, it receives the Atrato, by much the largest of its tributaries; and on the west it is half met across the already narrow neck by the Gulf of San Miguel, an inlet of the Bay of Panama. The eastern shore, happily the least important in its position, is said to be but little available for navigation.—3. The isthmus, originally traversed by Vasco Nunez de Balboa, governor of the infant colony, in 1513, is at one point only 30 miles from sea to sea. Two projects have been entertained with a view to the constructing of a ship-canal in this locality, both of them prompted and facilitated by remarkable depressions of the Cordilleras. One of them, which, however, does not confine itself wholly to the isthmus, proposes to link together the Atrato (q. v.) on the one side, and the San Juan on the other; while the second of them contemplates the direct junction of the Gulfs of D. and San Miguel. The Isthmus of D. appears to take the name also of Panama (q. v.); but, strictly speaking, this nomenclature denotes different, though continuous necks of land.

**DARIEN SCHEME, The**, one of the most disastrous speculations on record, and one which caused an unprecedented excitement in Scotland from 1695—in which year the Darien Company was established by act of the Scottish parliament, sanctioned by royal authority—till 1701, when the last of the disappointed adventurers returned home. The D. S. was projected by William Paterson, the founder of the Bank of England. Its object was to plant a colony on the Atlantic side of the Isthmus of

Panama, and so form a commercial entrepôt between the eastern and western hemispheres. An entire monopoly of the trade of Asia, Africa, and America, for a term of thirty-one years, was granted to the Company. At that time, the foreign trade of Scotland had been ruined by the English navigation act of 1660, which provided that all trade with the English colonies should be conducted in English ships alone, so that when Paterson opened his subscription-list, the nobility, the gentry, the merchants, and people, royal burghs, and public bodies in Scotland all hastened to subscribe. £400,000 were immediately put down on paper, of which £220,000 were actually paid up. Deputies in England received subscriptions to the amount of £300,000; and the Dutch and Hamburgers subscribed £200,000. The English parliament, however, actuated by a feeling of national antipathy, and the jealous clamours of trading corporations, gave its unequivocal condemnation to the scheme. The British resident at Hamburg, probably with the concurrence of the king (William III.), also made various insinuations against it. The result of this interference was the almost total withdrawal of the Dutch and English subscriptions. It must now be admitted, even by a Scotsman, that there *was* one fatal objection to the scheme—viz., the danger of settling on ground claimed by Spain, without coming to a proper understanding with that country beforehand. Unable, however, to see any sort of obstacles, incited by the vehement eloquence of Paterson, and dazzled by the magnificent proportions of the scheme, the Scotch hurried forward their arrangements. Five ships, with 1200 men on board, set sail from Leith for Panama on the 25th July 1698. They reached their destination in four months, and having bargained with the natives for a country which they called New Caledonia, the colonists fixed the site of what was to be their capital city, New Edinburgh, and built a fort in its vicinity, which they named New St Andrews. Having thus constituted their colony, they issued a proclamation of perfect freedom of trade, and universal toleration in religious matters to all who should join them. According to the act which established their company, all goods imported by them, with the exception of foreign sugar and tobacco, were free from all duties and impositions for 21 years; and thus, on the whole, they seemed for the first few months to be on the highway to success. But the climate, which was tolerable in winter, became unbearable in summer, and many sickened under it; their supplies also failed before they could derive a return from the soil; and on sending to the British colonies in America for provisions, they learned with the deepest indignation and despair that the British American colonies, having been informed that King William had not given his sanction to the expedition, had resolved to hold no intercourse with the new colony at Panama.

Sickly and desponding, they waited long for supplies from the mother-country; but the Company at home were not aware of their wretched condition, and none came. At length, having waited eight months for assistance, the colony broke up. In the meantime, 1300 colonists, including 300 Highlanders from the estate of Captain Campbell of Finab, who had charge of the expedition, had set sail from Scotland, but ere they arrived, the pioneers had fled. A Spanish force of 1500 men, and a squadron of 11 ships, immediately threatened the new-comers. Captain Campbell marched by night with a body of 200 men upon the Spanish camp, which he broke, and completely dispersed. On returning to the fort, however, he found it invested by the Spanish squadron. The ammunition of the colonists had now become exhausted, and they were obliged to capitulate, the Spaniards granting honourable terms to all except Captain Campbell, who, however, escaped, and reaching New York, obtained a passage to Scotland. The remainder of the colonists, too weak to weigh the anchor of the vessel which was to carry them home, had to be assisted in their departure by the Spaniards. Not more than 30, among whom was Paterson, who was rendered for a time lunatic by his dreadful misfortunes, ever reached Scotland. Of Paterson, who has been regarded by some writers as a swindler, Lord Macaulay, in his fifth volume of the *History of England*, says: 'There is not the least reason to believe that he was dishonest. Indeed, he would have found more difficulty in deceiving others, had he not begun by deceiving himself. His faith in his own schemes was strong even to martyrdom; and the eloquence with which he illustrated and defended them had all the charm of sincerity and enthusiasm.'



Scottish India House.

In Edinburgh, as the head-quarters of the D. S., a building was erected to accommodate the officials, and carry on the business of the Company. Known as the Scottish India House, this building still exists in connection with the establishment for the poor of the city—a melancholy memorial of a disconcerted national enterprise. The books and other documents which had belonged to the Company are contained in the Advocates' Library, where they are shewn as a curiosity. The most complete account of the D. S. is that by Mr J. H. Burton, printed by the Bannatyne Club.

**DARI'US**, or **DAREIUS**, is the name of several Persian kings, and, like the Egyptian word Pharaoh, is *titular* and not *personal*.—Darius I., the son of Hystaspes, a Persian noble, leagued himself with six other nobles to murder Smerdis, the Magian, who had usurped the throne on the death of Cambyses. The conspirators were successful in their plot, and having, after some discussion, fixed on the monarchical as the proper form of government, D. contrived to be elected king, 521 B. C. His position at first was very insecure, but his caution, skill, and energy enabled him to govern his vast dominions for thirty-six years. To strengthen himself, he married the daughter of Otanes, who had been the head of the conspiracy, and likewise took three wives from the royal House—viz., two daughters of Cyrus, and one of Cyrus's son, Smerdis. He then divided his empire into twenty satrapies, and determined the exact amount of taxation to be borne by each. In some of the remoter provinces, great confusion seems to have prevailed after the death of Smerdis, the Magian; and a proof of how little D. could effect at first is afforded by the conduct of Orœtas, the governor of Sardis, who for some time was quite defiant of his authority. Babylon next revolted, and D. besieged the city unsuccessfully for two years. At last, however, it was taken by an extraordinary stratagem of his general Zopyrus, 516. In 513, D., with an army of 700,000, crossed the Bosporus by a bridge of boats, marched through what is now known as European Turkey to the mouths of the Danube, crossed, and advanced against the Scythians. The expedition proved a failure. D. retreated, but detached from his main force an army of 80,000 men under Megabyzus, to conquer Thrace, while he himself returned to Persia, where he extended his authority in the East as far as the Indus. The assistance given by the Athenians and Eretrians to the Ionic states, when they ventured to throw off the Persian yoke, and the part which they took in the burning of Sardis, determined D., who was also influenced thereto by the banished Hippias, to attempt the subjugation of the whole of Greece. In 495, he sent Mardonius with an army into Thrace and Macedonia, and at the same time despatched a fleet against the islands. The former was routed by the Brygi in Thrace, the latter was shattered and dispersed by a storm when rounding the promontory of Mount Athos. In 490, he renewed his attempt. His fleet committed great ravages in the Cyclades, but his army was entirely defeated at Marathon by the Athenians, under Miltiades, the 'tyrant' of the Chersonese. In the midst of his preparations for a third expedition, D. died, 485 B. C.

Darius II., called, before his accession to the throne, *Ochos*, and after his succession, *Nothos* ('the Bastard'), was one of the seventeen bastard sons of Artaxerxes I. Longimanus. When Sogdianus, another of the bastards, had murdered the rightful king, Xerxes II., and assumed for himself the royal power, Ochos declared war against him, slew him, and secured the diadem for himself, 424—423 B. C. He now called himself *Darius*. His reign was ignoble. He shewed himself to be completely under the control of his eunuchs and his cruel step-sister and spouse Parysatis. Rebellions were constantly breaking out among his satraps, all of which, however, were crushed except that of Amyrtæus, satrap of Egypt, who made himself independent in 414. It was during the life of D., and chiefly through the craft of Tissaphernes, satrap of Asia Minor, and of his successor Cyrus the Younger, son of the king, that the Persians exercised so great an influence over the affairs of Greece in the last years of the Peloponnesian War. D. died 405—404 B. C.

Darius III., great-grandson of D. II., called, before his accession, *Codomannus*, was a monarch noted for his mild disposition, handsome person, and courageous spirit. He was raised to the throne through the help of Bagoas, after the murder of Arses, 336 B. C. But in spite of his superior qualities, he could offer no solid opposition to the advance of the Macedonians. At the battle of the Issus, in 333, his mother, wife, and three children fell into the hands of Alexander; the victory of Gaugamela, in 331, opened to the latter the way to Susa and Persia Proper. D. now fled to Ecbatana, in Media; and, on the approach of his opponent, to the northern provinces, where he was seized by Bessus, satrap of Bactria. Alexander, in a fit of generosity, hurried to deliver Darius. Bessus then prepared for flight, but D., refusing to follow, was stabbed by the barbarian, and left. The scouts of Alexander's cavalry found D. dying, and administered to his last necessities. Thanking the Grecian king for his magnanimity, and commending his family to his care, he expired (330). Alexander sent the dead body to Sisygambis, mother of D., to be interred in the tomb of the Persian kings. With him, the Persian empire, that had so long overshadowed Asia, came to a close.

**DARKHA'N**, Mount, a lofty granite mountain in Mongolia, in lat. 47° 36′ N., long. 110° 10′ E. It is interesting as the place whither annually repair large numbers of Mongolians, to do honour to the memory of Genghis Khan (q. v.), to whom a monument has been erected here.

**DA'RLING**, Grace, a name famous in the annals of heroism, was the daughter of William Darling, light-house keeper on Longstone, one of the Farne Islands, and was born at Bamborough, 24th November 1815. On the morning of the 7th September 1838, the *Forfarshire*, which, with 63 persons on board, had been wrecked among the Farne Islands, was seen by Darling from his light-house, lying broken on the rocks. At the solicitation of his daughter, then in her 22d year, he put off through the storm to the wreck, his only companion the noble girl who prompted the generous act. By wonderful strength and skill, they brought their boat to where the sufferers (nine in number) crouched, in momentary expectation of a watery grave, rescued them, and bore them safely to Longstone. Such an undertaking, so daring in itself, and so successfully carried out, filled every one with the warmest admiration. The light-house at Longstone, no longer solitary and peaceful, was visited by many of the wealthy and the great. Presents, testimonials, and money were heaped at the feet of the heroine; but she did not long survive her change of circumstances. She died of consumption, after a year's illness, on the 20th October 1842.

**DA'RLING**, a name derived from a governor of New South Wales, and applied to a district, a mountain-range, and a river in Australia.—1. A district in New South Wales, extending in S. lat. from 27° to 28° 15′, is exclusively pastoral, with a population of about 2500. It is traversed by the Condamine, one of the head-waters of the Murray. Under the designation of *Downs*, it contains the *counties* of Aubigny and Merivale.—2. A mountain-range, about 250 miles long, lying wholly in West Australia. It terminates, in the direction of the sea, at Point d'Entrecasteaux, pretty nearly the south-west extremity of the entire island. Its culminating summit is not less than 3500 feet above the sea-level.—3. The river Darling, in New South Wales, aptly characterised as 'mysterious,' demands special attention, not only in itself, but also in connection with some of the most striking peculiarities of the country. From the western declivities of the almost continuous ridge that skirts the eastern coast, innumerable torrents pour down into the vast plains, which gradually slope away towards the interior. The more northerly of these torrents converge in a central 'basin of clay,' on the 30th parallel of S. lat., where, within a comparatively narrow space, meet the Maranoa, the Condamine, the Dumaresque, the Gwydir, the Namoi, the Castlereagh, the Macquarie, and the Bogan. In this region, the channels undergo many transformations, sometimes losing themselves in wide marshes, and sometimes presenting an inextricable labyrinth of bifurcations and junctions. After parting with a large proportion of their volume, under the combined influences of evaporation and absorption, the united streams, now distinguished as the D., pursue a journey of 600 miles to the Murray, through plains which are habitable only on the immediate verge of the water-course. Through this immense reach, the D. receives not a single affluent; nay, on the contrary, it sends out many an offset, to bury itself in some stagnant lagoon. It may be added, that none of the so-called rivers of this region of Australia, with the solitary exception of the Murray itself, is really entitled to the name. Between lofty banks of bare earth, they exhibit at times an inundating flood, at times a mere series of detached pools of every size and shape.

**DA'RLINGTON**, or **DA'RNTON**, a burgh in the south of Durham county, in a rich tract, on a hill-slope, on the banks of the Skerne, near its junction with the Tees, 18 miles south of Durham city. It consists of a square market-place, from which branch several streets called gates. Pop. in 1861, about 16,000, many belonging to the Society of Friends. The chief manufactures are woollen yarns, for imitation Indian shawls, Brussels carpets, &c.; flax, optical-glasses, brass and iron wares. Near D. was the seat of George Allan the antiquary. St Cuthberts, the beautiful parish church, was built in the 12th c., and has three carved stone stalls, and a tower 180 feet high. At Oxen-le-field, three miles from D., are curious cavities of unknown origin, 75 to 114 feet in diameter, called Hell Kettles.

**DA'RMSTADT**, a town of Germany, capital of the grand-duchy of Hesse-Darmstadt, residence of the grand duke, and seat of government, is situated on the river Darm, 15 miles south of Frankfurt-on-the-Maine. It consists of an old and new town, both of which are surrounded by walls and ditches. The streets of the former are narrow and squalid, but those of the latter exhibit many imposing specimens of architecture. D. has five public squares, from the centre of one of which a fine Doric column rises to the height of 134 feet, and is surmounted by a statue of the Grand Duke Louis, who founded the new town. Besides the arsenal, the barracks, and the various religious edifices, one of which is crowned by a dome supported upon 28 large columns, D. has two palaces; one of these, the old ducal palace, contains the museums of painting—comprising 700 pictures, some of them by the most famous of the old masters—and natural history, in which are shewn fossil remains of the deinotherium. The palace contains also a public library consisting of 200,000 vols. D. is more dependent upon its ducal court and the government, which holds its seat there, than upon its commerce or manufactures, which are inconsiderable. Pop. (1855) 30,252.

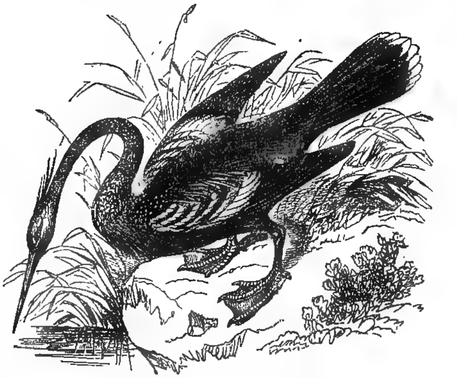
**DA'RNEL** (*Lolium temulentum*), a grass of the same genus with the valuable RYEGRASS (q. v.), an annual, common in cornfields in England and many parts of Europe. It has no tufts of leaves from the root, the glumes are as long as the spikelets, or longer, the spikelets contain 5—7 florets which are awned. This grass has from ancient times been reputed to have a narcotic poisonous seed, to which many bad effects were ascribed, which, in years of bad harvest, were observed to ensue upon the eating of bread or the feeding of horses upon oats. Even Lindley, in his *Medical and Œconomical Botany*, published in 1849, ascribes narcotic and acrid qualities to D. seed, and speaks of fatal consequences as produced by it when mixed with flour, saying that it 'is the only authentic instance of unwholesome qualities in the order of the Grasses.' On the other hand, it is asserted that very recent researches on the continent have completely established the perfect harmlessness of this grass and of its seed; and the effects which have been ascribed to it must therefore be regarded as proceeding from grain injuriously affected in some way by bad weather.

Darnel.

**DARNETAL**, a town of France, in the department of Seine-Inférieure, about 2½ miles east of Rouen. It is well built, and has two Gothic churches. Situated at the top of a narrow valley, and intersected by two streams, D. possesses unusual facilities for carrying on cloth and other woollen manufactures. Pop. 5910.

**DA'RNLEY, HENRY STUART, LORD**, husband of Mary Queen of Scots, the eldest son of the Earl of Lennox by Lady Margaret Douglas, was born in 1546, in England, where also he was educated. He was handsome in appearance, accomplished in manners, but fatally destitute of all moral and intellectual power. D. is interesting chiefly on account of the position which he occupied with respect to his wife. See STUART, MARY.

**DARTER** (*Plotus*), a genus of birds very nearly allied to Cormorants (q. v.), but having a bill longer than the head, perfectly straight, slender, and



Darter (*Plotus Anhinga*).

sharp-pointed; and also remarkable for the great length of the neck, which has obtained for them the name of *Snake-birds.* They derive the name D. from darting forward their bill at their prey by means of their long flexible neck. They are very voracious, and eat great quantities of fish, which they swallow entire. They are found in warm climates.

**DA'RTFORD** (Saxon, *Darentford*), a town in the north-west of Kent, 17 miles east-south-east of London by rail, on the left bank of the Darent, which is navigable for barges. It lies in a narrow valley between two steep hills. Pop. (1861) 6579. It has large corn-mills, cotton and silk printing-works, large powder and paper mills; also manufactures of oil, iron, and machinery. Near D. stood the first rolling, slitting, and wire-drawing mill in England, as well as the first paper-mill, built by Spielman, who died in 1607. Here stand the ruins of a nunnery, founded 1355, by Edward III., with 12 acres of walled orchards and gardens. This king held a tournament here in 1331. Wat Tyler's insurrection, in the reign of Richard II., broke out at D. in 1381. Watling Street, an ancient Roman road, crossed the river here. Near D. Heath are many ancient chalk hollows and pits, with deep shafts leading to numerous chambers and galleries, excavated probably for sepulture, for retreat, or to make use of the chalk.

**DA'RTMOOR**, a granitic table-land in the south-western part of the county of Devon, remarkable for its wild and rugged scenery, its towering rock-capped hills, the numerous streams that have their source in its boggy soil, and the many cyclopean relics of the aboriginal inhabitants that are scattered over its solitary wastes, where the deep silence is broken only by the sudden flight of the ring-ouzel, the screams of the curlew, or the shrill whistle of the lapwing, dotterel, or stone-plover. D. Proper (or the ancient and royal forest of that name) and its adjuncts, including the outlying common lands that present the same physical features, extend about 20 miles from east to west, and 22 miles from north to south, occupying one-fifth of the entire area of the county of Devon, or more than 130,000 acres. This moorland region, encircled by a natural rampart, moated by deep valleys, has a very considerable elevation above the surrounding country, and culminates in Yes Tor, 2050 feet above the sea-level. Its broken uneven surface has been compared, not inaptly, to 'the long rolling waves of a tempestuous ocean, fixed into solidity by some instantaneous and powerful impulse.'

The most important *rivers* that rise in Northern D. are the Dart, the Teign, the Taw, the West Ockment or Okement, the Lyd, the Tavy, and the Walkham; while from the swamps of Southern D. spring the Plym, the Yealm, the Erme or Aime, and the Avon, Aven, or Aune.

*Geologically*, D. is formed, for the most part, of granite rock, which has been protruded through the shales, slates, and sandstones of the Devonian system. Large masses of trap occur at White Tor, Cock's Tor, and other localities. Tin, copper, and manganese are found amongst the granite, of which four varieties—common, finer, red, and compact—are distinguished. These, as well as the several kinds of trap-rock, are much used for economical purposes. At Wheal, Duchy, and Birch Tor are productive tin mines. The *soil* of D. is composed chiefly of peat, which in the bottoms has accumulated in some places to the depth of 25 feet; it rests on a subsoil of fine sand. Many of the well-watered dells and ravines are fertile, while the whole moor affords pasturage for cattle, sheep, and horses. Amongst the mosses and lichens, with which the region abounds, are the *Lecanora perella* and the *L. tartarea*, or Cudbear Lichen. See CUDBEAR. Some years ago, both these lichens were largely exported; and it is said that, from 1762 to 1767 inclusive, nearly 100 tons of the *L. tartarea* were collected from the tors of the moor. Wistman's Wood, a grove of stunted oak-trees, averaging about ten feet in height, is of venerable antiquity. It stands on a rocky declivity about 400 yards in length, and measures less than 100 yards across the widest part. The *ornithology* of D. is more limited than formerly; the progress of cultivation and the preservation of game are driving away the eagle, the bustard, the crane, and the kite, which are now rarely seen. The black-cock is likewise becoming extinct. Dr Moore says: 'The frequenters of the uncultivated parts are now chiefly the sparrow-hawk, the hobby, the goshawk, the hen-harrier, the brown or marsh harrier, and the buzzard.' The *antiquities* of D., as illustrating ancient periods of British history, are worth an attentive study; of these, the Grey Wethers, below Sittaford Tor—a fine specimen of what is usually styled a Druidical circular temple—the vestiges of a large aboriginal village at Grimspound, the cromlech at Drewsteignton, the logan-stones and stone-avenues, the kistvaens, barrows, cairns, rock-pillars, and ancient trackways, whose story the old tors alone could tell, are examples. Many legends and stories of moorland adventure are related; but the most famous is that of the bold hunter, Childe of Plymstock, whose fate Carrington has celebrated in a spirited ballad. See Carrington's Poems, Mrs Bray's *Tamar and Tavy*, and article 'Lost on Dartmoor,' *Chambers's Journal*, vol. i. p. 350.

During the long war with France, consequent on the great Revolution and the career of Napoleon, a prison was erected in the centre of the western quarter of D., at about 1400 feet above the sea-level, for the accommodation of prisoners of war. The first stone was laid on the 20th March 1806, and the building was finished at a cost of £127,000. Prince Town sprang up close by, and soon became a thriving place. The prison is now used as a dépôt for convicts, who are employed in cultivating the adjacent moor.

The castle, manor, and forest of D. were granted by Henry III. to his brother Richard, Earl of Cornwall; and since 1337 A.D., D. has been permanently annexed to the Duchy of Cornwall.

See De la Beche's *Report on the Geology of Cornwall, Devon, and West Somerset* (Lond. 1839); and for a full account of D., *A Perambulation of the Ancient and Royal Forest of Dartmoor*, &c., by Rev. S. Rowe (Plymouth and Lond. 1856); also *Papers on the Geology, Soil, Botany, and Ornithology of Dartmoor*, by Ed. Moore, M.D., &c., in appendix of the above work.

**DA'RTMOUTH**, a parliamentary and municipal burgh and seaport, in the south of Devonshire, built in terraces on a steep slope 300 to 400 feet high, on the right bank of the romantic estuary of the river Dart, at a short distance from the sea. D. is 32 miles south-by-west of Exeter. The streets are narrow, and many of the houses very old, with overhanging stories, projecting gables, and wood-carvings. St Saviour's Church, of the 14th c., has a richly sculptured, painted, and gilt stone pulpit, a highly ornamented interior, and a beautifully carved rood-loft. A battery and the remains of a castle stand at the entrance to the harbour. Pop. (1861) 4238. D. returns one member to parliament. Many of the inhabitants are engaged in the pilchard and Labrador fisheries. The chief exports are woollens, cider, and barley. D. is a quarantine port of the English Channel, and has a considerable trade with the Mediterranean. In 1859, 1335 vessels, of 81,767 tons, entered and cleared the port.—At D., in 1190, the Crusaders, under Richard Cœur-de-Lion, embarked for the Holy Land. The French burned the town in the time of Richard I., but were repulsed in a third attack on it in 1404. In the reign of Edward III., D. furnished 31 ships for the siege of Calais. In 1643, Prince Maurice besieged and garrisoned D. for Charles I.; but in 1646, Fairfax stormed and took it. Sir Humphrey Gilbert, who took possession of Newfoundland for Queen Elizabeth, was born here. Newcomen, the inventor of the steam-engine, was an ironmonger here.

**DARU**, Pierre Antoine Noel Bruno, Comte, author, and also one of the ablest of the first Napoleon's ministers, was born at Montpellier, 12th January 1767, and in his sixteenth year entered the army. In 1791, he was appointed intendant of the army of Brittany; but having the misfortune to speak ironically of the English as '*our friends*,' the suspicious revolutionists threw him into prison as a royalist, where he remained till the fall of Robespierre. He spent his time in translating the Odes and Epistles of Horace (*Traduction en Vers des Poésies d'Horace*, 1800). Subsequently, he translated the Satires. In the same year in which his version of Horace appeared (1800), he published *Cleopedie, ou la Théorie des Réputations en Littérature*, a work full of spirit and felicitous turns of thought. His firmness, fidelity, and industry recommended him to Napoleon, who, in 1805, made him a councillor of state, and at a later period, intrusted him with the portfolio of the war-department. After the restoration of the Bourbons, he was made a peer. Thenceforth, he devoted himself exclusively to letters. He died 5th September 1829.—D. was a member of the Institute and of the Academy of Sciences. His writings are numerous. Besides those already mentioned, the chief are *Histoire de la République de Venise* (7 vols. 1819—1821); *Histoire de Bretagne* (3 vols. 1826); his *Eloges;* his examination of the *Génie du Christianisme;* his *Discours sur les Facultés de l'Homme* (in verse); and his *Discours sur la Liberté de la Presse.*—His son, Napoleon Count Daru, named after the Emperor, was born in 1802, and has had the fortune (strangely enough) to be as much disliked by Napoleon III. as his father was liked by Napoleon I. Some time after the *coup d'état*, to which he had strongly opposed himself, he was placed on the list of the proscribed.

**DA'RWIN**, Erasmus, M.D., an English physician, natural philosopher, and didactic poet, was born 12th December 1731, at Elton, near Newark, in Nottinghamshire; studied first at Cambridge, and afterwards at Edinburgh, where he took his degree; and finally settled in Derby, where he died 18th April 1802. D. had once a great reputation as a physiologist, but his system is, for the most part, inconsequential, baseless, and untenable. At the same time, many of his ideas are original, suggestive, and contain within them the germs of important truths. His strength and his weakness lay in his faculty for seeing analogies in nature. Sometimes he is exceedingly happy in his discoveries, at other times, he is quite fantastical. The same remarks hold good as regards his verse, where, amid the frequent extravagance and incomprehensibility of his notions, there burst forth strains of genuine poetry. D.'s chief works are his *Botanic Garden*, in verse (Lond. 1781); his *Zoonomia, or the Laws of Organic Life* (1793); and his *Phytologia, or Philosophy of Agriculture and Gardening* (1800).

**DARWIN**, Charles, F.R.S., a living naturalist of the highest eminence, was born at Shrewsbury, February 12, 1809. He is the son of Dr Robert W. Darwin, F.R.S., and grandson of Erasmus Darwin (q. v.). His mother was a daughter of Josiah Wedgwood, the famous manufacturer of pottery. After attending a public school at Shrewsbury for some years, he studied at Edinburgh University for two sessions, and thence proceeded to Christ College, Cambridge, where he took his degree of B.A. in 1831. He now volunteered to go as naturalist in H.M.S. *Beagle*, commanded by Captain Fitzroy, R.N., and started for a survey of South America, and the circumnavigation of the globe, December 27, 1831, returning to England October 2, 1836. His entire life, so far as his health has permitted, has been devoted to scientific researches. D., who is a fellow of the principal scientific societies, has obtained the Royal Society's medal, and the Wollaston medal of the Geological Society.—His earliest well-known work, *The Voyage of a Naturalist* (2d ed. 1845), is a most interesting and beautifully written work; and carried the author's name far beyond the narrow limits of scientific fame. In 1839, appeared his *Journal of Researches into the Geology and Natural History of the various Countries visited by H.M.S. Beagle;* in 1840—1843, the *Zoology of the Voyage of H.M.S. Beagle*, published by government, to which D. contributed the introduction and many of the notes; and in 1846, his *Geological Observations on South America.* These publications, as well as his numerous geological and zoological papers published in the *Transactions of the Geological Society*, and elsewhere, prepared scientific circles to expect something great at his hands. Nor were they disappointed. In 1851—1853, appeared his *Monograph of the Family Cirrepedia.* This work has been characterised by a competent authority as one of the most remarkable works on zoology produced during the present century. It contains an accurate definition of every known species, besides bringing forward several singular and important facts in the history and economy of these animals. In 1859, D.'s name became 'familiar as a household word' to the mass of educated and semi-educated Englishmen through the publication of his startling work, *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle of Life* (Lond. Murray). His theory is, that there is a real variability in organisms, acting through the medium of the reproductive system; and that when the progeny so varied finds itself better adapted for the surrounding conditions than its predecessors, it gains an ascendency in the competition of the multitude of creatures for existence, establishes itself, and exterminates those which it has vanquished. D.'s views, which are supported and illustrated with the greatest ingenuity, are the result of long years of patient observation on the part of a man who is as indefatigable in his experimental inquiries as he is bold in his speculative generalisations. D.'s book has excited the liveliest controversy, which is still going on. See Species.

**DA'RWIN MOUNT and SOUND** are on the south-west side of King Charles's South Land, the largest of the three principal islands which together constitute Tierra del Fuego, at the southern extremity of America. The mountain is nearly 7000 feet above the level of the sea.

**DASHKO'V**, Princess Ekaterina Romanova, a celebrated Russian lady, daughter of Count Vorontsov, was born 1744, and from her earliest youth received a careful training. Her great desire was to obtain, by a solid study of the Greek and Latin languages and history, an insight into the spirit of antiquity. She was an intimate friend of the Empress Catharine II., and one of the heads of the conspiracy formed against Peter III., the success of which secured the throne to Catharine. Her conduct in this dangerous affair was, in truth, quite Amazonian; she rode forth in uniform at the head of a part of the troops whom she had instigated against Peter; but soon afterwards quarrelled with Catharine, because the latter would not gratify her desire to be made colonel of the Imperial Grenadiers. She now removed from the court, obtained permission to travel, and visited Germany, England, France, and Italy, where she made the acquaintance of many learned men (among others, Garrick, Dr Blair, and Dr Robertson, with the last of whom she wished to place her son for the purpose of being educated), and in 1782 returned to St Petersburg. The empress and she were reconciled to each other, and the princess was appointed Director of the St Petersburg Academy of Arts and Sciences; and in 1783, President of the Russian Academy, established at her own suggestion in imitation of the French *Académie.* On the death of Catharine in 1796, she was deprived of her offices, and ordered by Paul III. to retire to her estates at Novgorod. She died at Moscow, 4th January 1810. Besides several comedies and occasional magazine-papers, the Princess D. was mainly instrumental in inducing the Russian Academy to draw up a dictionary of the Russian language. This work was completed in twelve years. The princess herself assigned the various letters of the alphabet to different scholars, took three herself, and superintended the execution of the whole. Her very interesting memoirs were published by Mrs W. Bradford (2 vols., Lond. 1840).

**DA'SŸURE** (*Dasyu'rus*), a genus of carnivorous marsupial quadrupeds, nearly allied to the opossums; but differing from them in having only eight incisors in the upper, and six in the lower jaw, and only twelve molars in each jaw; also in their tail being everywhere covered with long hairs, and not prehensile; in the hinder thumb being reduced to a mere tubercle, or wanting; and in the important anatomical character of the want of a cœcum. All the species are Australian. The URSINE D., or Ursine Opossum (*D. ursinus*), was very abundant in the north of Van Diemen's Land, when first colonised, and very destructive to sheep and poultry. It is about the size of a badger, of a stout form, with a tail half as long as the body; the body and tail covered with coarse black hair, marked with white bands. It burrows in the ground. It is very untamable. The Spotted-tailed D. (*D. macrourus*) is about as large as a cat, has a tail fully as long as the body, is of a rich brown colour with white spots, and as well as a rather smaller species (*D. Maugii*), the *wild cat* of the colonists, is very destructive to poultry in Van Diemen's Land.

Ursine Dasÿure (*D. ursinus*).

**DATE** (Lat. *datum*, given), the precise time at which a document was written, or an event happened. The importance of accurately ascertaining the date of an event or writing is very obvious, but the difficulty which there may be of doing so is not so apparent. It might be thought, for example, that, at least in modern times, where the day of the month and year are authoritatively set down, there can be no room for any further question; but it is not so. If, for instance, we refer to a newspaper of the reign of Queen Anne, we shall see the *Amsterdam Gazette* of the 22d February translated in the *London Gazette* of the 13th February, and abridged in the *Edinburgh Courant* of the 19th February, all of the same year, 1705. And this is but one of several seeming inconsistencies or contradictions of the same sort.

In the first place, the difference of the two *styles* by which dates are reckoned may cause a discrepancy of ten, of eleven, or of twelve days, according to the century to which the date belongs. Until 1582, there was but one style or calendar throughout Europe; but in that year, Pope Gregory XIII. introduced the 'new style' or 'Gregorian calendar,' which at once corrected the long accumulated errors of the old method of computing time, by declaring the 5th to be the 15th of October 1582, or, in other words, by striking ten days out of the almanac of that year. The new style was adopted generally in Roman Catholic countries. Most Protestant countries, on the other hand, continued for a longer or shorter period to use the 'old style,' or 'Julian calendar.' It is necessary, therefore, in dealing critically with dates after 1582, to ascertain what 'style' was in use at the time and place in question. This, in not a few cases, may call for some inquiry; but generally, the following table will serve to shew when the chief states of Europe adopted the new style:

| Year. | Country. |
|---|---|
| 1582. | Great part of Italy, France, Lorraine, Portugal, Spain, Holland, and the greater part of the Netherlands. |
| 1584. | The Roman Catholic parts of Germany and of Switzerland. |
| 1586. | Poland. |
| 1587. | Hungary. |
| 1682. | The city of Strasburg. |
| 1700. | The Protestant parts of Germany and of Switzerland, Guelders, Zutphen, Utrecht, Friesland, Groningen, and Overyssel. |
| 1749 or 1751. | Tuscany. |
| 1752. | Great Britain and Ireland. |
| 1753. | Sweden. |

In Russia and Greece, the old style is still followed, and it obtains generally in the East. Thus, what was the 12th January 1861 at Paris and London, was the 31st December 1860 at Athens and St Petersburg.

But difference of *style* is not the only cause of perplexity in dates. Countries using the same style, and therefore agreeing as to the day of the *month,* may differ as to the *year* to which they refer an event. Thus, the beheading of King Charles I. was reckoned, both in England and in Scotland, to have taken place on the 30th of January; but while England held the year to be 1648, Scotland held it to be 1649. The cause of this discrepancy was the difference which obtained as to the beginning of the year. By the English, the year was held to begin on the 25th of March; by the Scots, on the 1st of January. It becomes necessary, therefore, in considering dates, to keep in view not only the style which was used, but the day on which the year was accounted to commence. There was much variation in this respect, not only between one country and another, but even in the same country as between one time and another, as well as between its different provinces at the same time. The new years' days most commonly used were the Nativity or Christmas (25th December), the Circumcision (1st January), the Annunciation or Lady Day (25th March), and the Resurrection or Easter. The 1st of January was adopted as the commencement of the year by France in 1563, by Scotland in 1600, by England in 1752. In this last country, the inconvenience of dating by a different year from most of the other great European states had been so generally felt, that for some time before the new mode of computation was sanctioned by act of parliament, dates falling between 1st January and 24th March were commonly expressed in both ways, thus: 2d February 170$\frac{6}{7}$, or 1706–7, the lower or last figure indicating the year according to the present reckoning.

Hitherto, we have spoken of dates where both the year and the day of the month are set down in figures. But in ancient writings, even where the year is expressed in figures, nothing is more common than to indicate the day of the month only by reference to some festival or other peculiarity in the service of the church. Thus, an English letter of the latter part of the 15th c. is dated in this way: 'Written at Paston, in haste, the Wednesday next after *Deus qui errantibus;*' that is, the first Wednesday after the third Sunday after Easter, on which day that portion of the church service which is called the *introit* begins with the words *Deus qui errantibus.* So, again, as late as the year 1610, the battle of Weissenburg, near Prague, is described by the contemporary chroniclers as having been fought 'upon the Sunday on which the church sings *Reddite quæ sunt Cæsaris Cæsari;*' that is, the 22d Sunday after Pentecost, which, in the year referred to, fell upon the 8th of November. A still more common way of dating was by reference to a saint's day. Thus, the English parliament which met at Westminster on the 6th October 1399, is described in the contemporary record as meeting 'on Monday, the Feast of St Faith the Virgin;' and the Scottish parliament which met at Scone on the 3d December 1318, as meeting 'on the Sunday next after the feast of St Andrew the Apostle.' In order, therefore, to interpret all this class of dates—and it is a very large one—recourse must be had to the calendar and service books of the church, or to the 'glossaries of dates' and 'catalogues of saints' days' which antiquaries have compiled from them.

For centuries, it was more common to date by the year of the king's reign than by the year of our Lord. The risk of error in reducing this way of computation to that now in use is such, that in Rymer's *Fœdera*, a great collection of English state papers, printed at the public expense, in the beginning of the 18th c., many documents of all the reigns from Richard I. to Edward IV. are misplaced by a whole year. These mistakes arose chiefly from insufficient inquiry as to the day from which the king dated his reign. This was assumed to be from the day of his predecessor's death, but in point of fact the early English sovereigns dated their reign only from the day of their coronation. Where a date, therefore, has to be ascertained by reference to a regnal year, it becomes necessary to make sure not only of the time when the king came to the throne, but of the very day from which he reckoned his reign. In the case of the popes of Rome, this inquiry is at once more than usually necessary, and more than usually troublesome, inasmuch as, until comparatively recent times, scarcely any two of them in immediate succession dated or computed on the same principle. Not a few of them, indeed, adopted different computations at different times of their reign. Thus, Pius II., during his pontificate of six years (1458—1464), commenced the year sometimes on the 25th December, sometimes on the 1st January, and sometimes on the 25th March. Some popes, again, dated from the day of their election; others, from the day of their consecration or coronation. Nor is it only in interpreting regnal years into modern chronology that there is a chance of error; there is proof that occasionally the regnal years were wrongly computed at the time, by the kings themselves, or rather by the officers who wrote their charters. Thus, for example, it has been discovered that from the time that King David II. of Scotland returned from captivity in 1357, the year given as that of his reign is one year short of the truth. In dealing with regnal years, there is yet another risk of mistake to be guarded against. Until the 16th c., it was not common for kings to distinguish themselves by numbers from their predecessors of the same name. In order, therefore, to discriminate one from another, charters or other deeds of the English Henries and Edwards, or the Scottish Roberts and Jameses, recourse must be had to such tests as the character of the writing, its seal, its style and language, and above all, the names of the persons enumerated in it.

With no other help than is to be gained from such tests, the antiquary is often called on to fix the date of a charter, containing no reference to the year of our Lord, the year of the king's reign, the year of the pope's pontificate, or any other measure of time. If the persons mentioned in the deed be men of note, he may be able to ascertain its date to a year, a month, or even a day; on the other hand, if they are obscure, he may be unable to reduce the date within a narrower range than 50 or even 100 years.

The skill of the antiquary is not unfrequently put to the proof in another way. Dates were often recorded by reference only to an event of the time. Thus, one leaf of the Scottish statute-book contains two acts of parliament, with no more explicit record of their date than that the one was passed 'at Aberdeen in Lent next after the coming in Scotland of Vivian the Legate of the Apostolic See;' and that the other was passed at Stirling 'on the Monday next before the feast of St Margaret the Maiden next after the first coronation of Philip king of the French.' An examination of contemporary chronicles fixes the date of the one statute to 1177; of the other, to 1180.

In order to facilitate the discovery and rectification of dates, various elaborate works have been published. By far the most important—*L'Art de Vérifier les Dates des faits Historiques, des Chartes, des Chroniques et autres Monuments*—is due chiefly to the labours of the Benedictines of St Maur. The best edition of this admirable work is that of Paris, in eight folios, the first three containing the period from the birth of Christ till the year 1770, being published in 1783—1787; the fourth, containing the period before the birth of Christ, in 1820; and the last four, continuing the work from 1770 downwards, in 1821—1838. A reprint of this edition, in 42 octavos, appeared at Paris in 1818—1844. Of the other French works, it will be enough to name two—the *Nouveau Traité de Diplomatique,* also by the Benedictines of St Maur (Par. 1750—1765, in 6 vols. 4to), and the *Eléments de Paléographie, par Nat. de Wailly* (Par. 1838, in 2 vols. 4to). The best English work is *The Chronology of History,* by the late Sir Harris Nicolas, published in Lardner's *Cabinet Cyclopædia.* It has passed through two editions; the last bears the date of 1838.

**DATE OF DEED.** See DEED.

**DATE PALM** (*Phœnix*), a genus of palms, the most important species of which is the common Date Palm, the *Palm Tree* of Scripture (*Ph. dactylifera*), a native of the northern half of Africa, the south-west of Asia, and some parts of India, and which has also been brought into cultivation in the south of Europe, and might certainly be introduced with advantage into the south of the United States, and many warm parts of America and Australia. The stem, which is straight and simple, reaches a height of 30—60 feet, and bears a head of 40—80 glaucous pinnated leaves, of 8—10 feet long, with lanceolate acuminated leaflets, very much closed up, and a number of branching spadices, each of which on the female tree bears in general 180—200 fruits (dates, *dactyli*). A bunch of dates weighs 20 or 25 pounds. This is one of the most important and useful of all the palms, and is indispensable to millions of the human race, on account of the supply of food which it affords them. In Egypt and the other countries on the north coast of Africa, in Persia, and in Arabia, dates form the principal food, and date palms the principal wealth, of the people. The fleshy part of the fruit contains 58 per cent. of sugar, accompanied by pectin, gum, &c. The main ingredient, therefore, in a dietetic point of view, is the sugar. The fruit is eaten either fresh or dried, and in the latter state becomes an article of commerce. Cakes of dates pounded and kneaded together, and so solid as to be cut with a hatchet, are the store of food provided for African caravans on their journey through the Sahara. A liquor resembling wine is made from dates by fermentation, and also a kind of vinegar. In Persia, an ardent spirit is distilled from dates. The soft pith at the summit of the palm stem, along with the young leaves not yet unfolded, are eaten under the name of *palm cabbage*, and the undeveloped panicles of flowers also form an article of food to the Persians and Arabs. The liquor called *palm wine* is prepared by fermentation from the sap of the palm, the top being cut off, and a hollow scooped out, in which the sap collects. Three or four quarts are obtained daily from a single palm for ten days or a fortnight. The quantity afterwards diminishes, till the tree becomes quite dried up. Many of the inhabitants of North Africa use the roasted date stones or seeds as a substitute for coffee, for which purpose the seeds of the *Phœnix reclinata* are also employed in the south of Africa. The seeds or stones of dates are in many places ground for the sake of the oil which is afterwards obtained from them by expression, and the remaining paste or cake is given as food to cattle. From leaf-stalks of the common D. P., all kinds of basket and wicker work are also made, and walking-sticks, fans, &c. The leaves themselves are made into bags, mats, &c.; the fibres of the web-like integuments at the base of their stalks into cordage. The wood is used for building, fences, &c.—The Toddy Palm of the north of India, or Wild Date Palm (*Ph. sylvestris*), so nearly resembles this species, that it is doubtful if it is distinct. In some places, the trees present a curiously distorted and zigzag appearance, from the practice of yearly tapping the alternate sides for the sap or *toddy*. The incision is just below the crown, and slopes upwards and inwards; a vessel is hung below the wound, and the juice conducted into it by a little piece of bamboo. It forms a grateful and wholesome beverage; readily also fermenting into palm wine, and by distillation yielding *Arrack* (q. v.); whilst if boiled down without being allowed to ferment, it yields the saccharine sirup called *jaggery*, from four pounds of which one pound of sugar is obtained, a single tree producing about seven or eight pounds of sugar annually. The operation of tapping for toddy spoils the fruit of the tree, which is small and much inferior to the African date. It is, however, eaten.—Another species, *Ph. paludosa*, the most gregarious of Indian palms, growing only six or eight feet high, covers the whole landscape of the Sunderbunds with the liveliest verdure. *Ph. acaulis*, *Ph. farinifera*, and *P. spinosa*, are three other closely allied species; the first grows in the driest soils in the damp valleys of the Himalaya to 5000 feet above the sea. All three are dwarf species.

Date Palm.

**DATE PLUM** (*Diospyros*), a genus of plants of the natural order *Ebenaceæ*, consisting of deciduous trees, whose fruit is a globose berry, natives of warm or temperate climates. The black heartwood of some species is Ebony (q. v.), and the hard timber of others is known as Ironwood. Some are valued for their fruit. The Common Date Plum, or Pishamin, also called the European Lotus and the Date of Trebisond (*D. Lotus*), is a tree of 20—40 feet in height, with oblong shining leaves and small reddish white flowers, a native of the coasts of the Caspian Sea, Mauritania, &c., but cultivated and naturalised in the south of Europe. Its fruit is of the size of a cherry, and in favourable climates larger, yellow, sweet, and astringent. It is eaten when overripe, like the medlar, or is used for conserves. The tree bears fruit abundantly in the neighbourhood of London, but is somewhat tender in the climate of Britain, and its fruit more austere than in more southern regions. This fruit has been supposed by some to be the *Lotus* (q. v.) of the Lotophagi. The Virginian Date Plum, or Persimon (*D. Virginiana*), is a tree of 30—60 feet high, with ovate oblong leaves and pale-yellow flowers, a native of the southern states of North America, where one tree often yields several bushels of fruit. The fruit is about the size of a bullace, reddish, with six to eight oval seeds. It is not palatable till mellowed by frost, and is sweet and astringent. A kind of beer or cider and an ardent spirit are made from it.—The *Mabola* (*D. Mabola*) is cultivated as a fruit-tree in the Isle of France. Its fruit is about the size of a quince, and has a very agreeable flavour.—The *Kaki* (*D. Kaki*), sometimes called the Keg-fig, is a Japanese tree, sometimes kept in green-houses in France and England. The sweetmeat called *Figues-caques* is made from this fruit in France. The fruit resembles a plum. It is occasionally brought from China as a dried sweetmeat.—The fruit of some other species of *Diospyros* is also edible, as that of *D. decandra*, a large yellow berry, which, notwithstanding a disagreeable smell, is sold in the markets of Cochin-China.

**DA'THOLITE**, a mineral of a grayish or greenish white colour, occurring both massive and crystallised in rhombic prisms, the edges and angles of which are cut off by planes. It is composed of boracic acid, silica, and lime, with a little water. It has been found both in gneiss and in trap rocks. The Salisbury Crags and Corstorphine Hill, near Edinburgh, are localities for datholite.

**DATISCA'CEÆ**, a small natural order of plants, allied to *Begoniaceæ*, and consisting of herbs and trees, chiefly natives of the temperate parts of the northern hemisphere. *Datisca cannabina*, a plant much resembling hemp in its general appearance, a native of Crete, possesses very marked tonic properties. It contains also an amylaceous substance, called *Datiscin*, resembling inulin. It affords a yellow dye.

**DA'TIVE.** See DECLENSION.

**DATU'RA.** See THORN APPLE.

**DAUBENTON**, LOUIS JEAN MARIE, a French naturalist, was born at Montbar in Burgundy, 29th May 1716. His father wished him to be an ecclesiastic, and sent him to acquire a knowledge of theology at the Sorbonne in Paris, but D. had no inclination for this study, and gave himself up to that of medicine and anatomy. In 1741, after he had taken his degree at Rheims, he returned to Montbar to practise his profession. In the following year, however, his old school-fellow, the Comte de Buffon, induced him to come to Paris, and assist him in the preparation of his great work on Natural History. For this office, D. was admirably qualified. The sobriety of his understanding, the scrupulous care with which he pursued the smallest investigations, his perseverance and industry, were in complete contrast to the impatient spirit and rapid generalising of his brilliant coadjutor, and enabled him to correct and moderate some of Buffon's hasty theories, as well as to substantially enrich the work with a multitude of new and important facts relative to the anatomy of animals. Unfortunately, Buffon, who was exceedingly jealous, allowed himself to be influenced unfavourably in regard to D., on account of the high estimation in which the Parisian savans generally held the latter. The result was an estrangement between the two friends (who were, however, ultimately reconciled), and science suffered severely in consequence. D., who had contributed richly to the first 15 volumes of the *Histoire Naturelle*, ceased to have further connection with the work, and the subsequent labours of Guéneau, de Montbéliard, Bexon, and Sonnini, but ill supplied the want which his absence created. D. now devoted himself almost entirely to his duties in the *Jardin du Roi*, in which he held an appointment. In 1778, he was made Professor of Natural History in the College of Medicine. During the Revolution, the Convention also appointed him Professor of Mineralogy in the Museum of Natural History. He died 1st January 1800.

Besides his labours in connection with the *Histoire Naturelle*, D. contributed largely to the first *Encyclopédie*. In the Memoirs of the Académie des Sciences, and in those of the Société de Médecine, are to be found a multitude of his most interesting and valuable papers on natural history and mineralogy. Cuvier composed a notice of D.'s life and works for the Memoirs of the Institute.

**DAU'BENY**, CHARLES GILES BRIDLE, M.D., F.R.S., Professor of Botany and Chemistry in the university of Oxford, has devoted himself chiefly to the elucidation of natural phenomena by the aid of chemical science. His attention was at an early period directed to the chemistry of volcanic action, and one of his first productions was *An Essay on the Geological and Chemical Phenomena of Volcanoes* (Oxford, 1824), which was followed by his great work, *A Description of Active and Extinct Volcanoes* (Lond. 1826). It applies in a remarkable manner the principles of chemistry to the phenomena produced by volcanic changes. To the examination of mineral and thermal springs, a subject closely allied to that of volcanic investigation, D. has also applied himself. In 1837, he visited America for scientific purposes, and has published the results of his observations, of which the principal are, *Notice of the Thermal Springs of North America* (1838), and *Sketch of the Geology of North America*. Italy and Auvergne have, on account of their volcanic phenomena, attracted the notice of D., and largely employed his pen. He has published largely in the 'Transactions' of various scientific societies. His *Introduction to the Atomic Theory* (1831), and *Lectures on Agriculture* (1841), are very valuable.

**DAU'CUS.** See CARROT.

**DAULATABA'D.** See DOWLATABAD.

**DAUMIER**, HENRI, a celebrated French caricaturist, was born at Marseille in 1810. Fashion, tittle-tattle, scandal, politics, blemishes of figure, and oddities of character have in turn inspired his inexhaustible genius for mockery. Few among his illustrious contemporaries have escaped his pencil, and the worst of it is, that his caricatures have always some strikingly truthful feature about them. D. made his *début* in the *Charivari*, in a series of sketches from *Robert Macaire*, after which followed *Les Actualités*, *Les Divorceuses*, *Les Femmes Socialistes*, *Les Philanthropes du Jour*, *Les Grecs*, '*Les Gens de Justice*, *Les Bons Bourgeois*, *Les Pastorales*, and *Les Papas*. The revolution of 1848 suggested two of his most remarkable series—*Idylles Parlementaires*, and *Les Représentants représentés*. D. is still employed on the *Charivari*. He has been called by French critics the *Aristophanes* and the *Paul Louis Courier* of caricature.

**DAUN**, LEOP. JOS. MARIA, GRAF VON, commander-in-chief of the imperial troops during the Seven Years' War, was the son of Wirich Philipp Lorenz von Daun, a distinguished officer in the Austrian service, and was born at Vienna 25th September 1705. Entering his father's regiment, he acquired no inconsiderable reputation during the Turkish campaigns, 1737—1739. The Austrian Wars of Succession also afforded him many opportunities of displaying that combination of valour and prudence for which he was famous. After the peace with Prussia in 1745, D. became Master-general of the Ordnance, fought against the French in the Netherlands, 1746—48, and in 1754 received the dignity of field-marshal. Before this, he had, in spite of many obstacles, introduced into the imperial army a new military system, and reorganised the Military Academy at Vienna. At the commencement of the Seven Years' War, he commanded the army of Moravia in 1757, and neutralised the defeat of the Austrians under General Broune near Prague, by driving Friedrich II., who had beleaguered that city, as far as Collin, and forcing the king, after a hard-fought battle, to evacuate Bohemia. On the 14th of October 1758, he gained another victory over Friedrich at Hochkirch, and but for the too late arrival of the Prince of Baden-Durlach with reinforcements, would probably have annihilated the Prussian army. On the 25th of November 1759, at Maxen, he compelled Fink, the Prussian general, with 11,000 men, to surrender. After this, however, he gained no important successes. Friedrich began to understand his tactics, and to conduct his campaigns accordingly. D. died 5th February 1766.

**DAUNG**, a tract within the limits of the presidency of Bombay, contains 950 square miles and 70,300 inhabitants, extending in N. lat. from 20° 22′ to 21° 5′, and in E. long. from 73° 28′ to 73° 52′. It is subdivided into several petty states, the whole being under one feudal chief, who is styled the Rajah of Daung. The country is valuable principally on account of its teak-forests, which are rented by the British government.

**DAU'PHIN** (Lat. *Delphinus*), formerly the title of the eldest son of the French king, was originally that of the sovereign lords of the province of Dauphiné. The last of these, Humbert II., dying childless (1349), bequeathed his possessions to Charles of Valois, grandson of Philippe VI. of France, on condition that the heir-apparent to the throne of France should bear the title of D. of Vienne, and govern the province. Louis IX. conferred on the D. almost sovereign rights; but after his time these were gradually abridged, until Dauphiné was placed under the same laws as the rest of the kingdom, and the title became merely honorary. After the revolution of 1830, it was abolished altogether.

**DAUPHINÉ**, formerly a frontier province in the south-west of France, now comprises the departments Drôme, Isère, and Hautes Alpes. After the fall of the Roman empire, D. formed the southernmost part of the kingdom of Burgundy. It then passed under the dominion of the Franks, and after the dismemberment of the Carlovingian monarchy, it became a portion of the new Burgundian kingdom of Arles. It then passed by legacy into the possession of the German emperor in 1032, and remained united with Germany till the middle of the 14th c., when it was presented to France by the last of the lords of Dauphiné. See DAUPHIN. The old rulers of the land bore the title of Dauphin (a title which probably originated in their having the figure of a *dolphin* for their crest), and the name was afterwards transferred to the district.

**DAUPHIN'S CROWN** is a circle of gold set round with eight fleurs de lis, closed at the top with four dolphins, their tails conjoined in a fleur de lis.

**DAUW** (*Equus Burchellii*), a South African quadruped, which may be regarded as intermediate between the zebra and the quagga, and is sometimes called the *Zebra of the Plains*, and by the Cape colonists the *Bonte Quagga*, or *Striped Quagga*. In the language of the Bechuanas, it is called *Peetsi*. It is found in numerous herds in the wide plains north of the Orange River, is rather larger than the zebra, and of more robust figure; of a light bay colour, the belly, legs, and tail white; the face, head, and body striped with black; the tail is tufted to near the root. The hoofs are much less concave beneath than those of the zebra, and are thus adapted to the plains, as those of the zebra are to the rough surface of the mountains. The D. is less easily domesticated than the quagga, but more so than the zebra.—This, or a very similar species, is found as far northwards as Congo and the Galla country.

**D'AVENANT**, SIR WILLIAM, an English poet and playwright, was born in the year 1605 or 1606 at Oxford, where his father kept the Crown Inn, a house at which Shakspeare was in the habit of stopping when on his journeys between London and Stratford. D., while still a child, had a great admiration for Shakspeare, and when only ten years of age, on the occasion of Shakspeare's death, the precocious boy penned an ode *In Remembrance of Master William Shakspeare.* He began to write for the stage in the year 1628, and ten years after, on the death of Ben Jonson, he was appointed poet-laureate. He afterwards became manager of Drury Lane Theatre, but entering into the intrigues of the civil war, he was apprehended, and cast into the Tower. He escaped, however, to France, and returning, distinguished himself so much in the cause of the royalists, that he was knighted by Charles after the battle of Gloucester. D. a second time got into difficulties, and was confined in the Tower for two years, when he was released, as is said, on the intercession of Milton. Once more free, he set about establishing a theatre, and succeeded. After the Restoration, he was favoured by royal patronage, and continued to write and superintend the performance of plays until his death, April 7, 1668. D.'s epic, entitled *Gondibert*, a poem of about six thousand lines, is now almost wholly forgotten.—CHARLES D'AVENANT, son of the preceding (b. 1656, d. 1714), distinguished himself as a writer on political economy and finance. His chief works are—*An Essay upon Ways and Means of Supplying the War* (1695); *Discourses on the Public Revenues and the Trade of England* (1698); *A Discourse upon Grants and Resumptions* (1700); *An Essay upon the Balance of Power; The Right of making War, Peace, and Alliances* (1701); *Essays upon Peace at Home and War Abroad* (1704), &c. A selection of his works was published in 1771 by Sir Charles Whitworth, afterwards Earl Whitworth.

**DA'VENTRY**, an ancient municipal borough in the west of Northamptonshire, at the sources of the Avon and Nene, 13 miles west of Northampton, and near the Birmingham Railway, Grand Junction Canal, and Watling Street. It is well built on an eminence, and has two principal streets. Pop. (1861) 4233. The chief manufactures are shoes and whips for export. D. was occupied by Charles I. in 1645, before the battle of Naseby. A mile to the east of D., on Dane's or Borough Hill, is a foot-shaped Roman camp, supposed to be Ben-avenna, one of the largest in the kingdom. Near it is a single ditched camp of an acre in extent.

**DA'VID** (Heb. 'Beloved'), king of Israel, the ninth and youngest son of Jesse, belonged to the tribe of Judah, and was probably educated in one of the schools of the prophets. He first publicly signalised himself by slaying Goliath of Gath, a gigantic Philistine, who had 'defied the armies of Israel.' Previously, he had acquired a considerable reputation as a skilful harper, and had subdued by his music the paroxysms of insanity which afflicted Saul at certain seasons. By Samuel he was anointed king during the lifetime of Saul, who soon began to regard him as a dangerous enemy, and persecuted him. A kind of intermittent war between the two was the consequence, in which D. was often reduced to great straits. At first, he was simply in the position of a guerilla chief, and his comrades were mainly persons in desperate circumstances—'all who were in distress, in debt, or discontented.' Latterly, he lived among the Philistines as one of themselves, and from the Philistine prince of Gath obtained a present of the strong fortress of Ziklag, after which he was joined by a class very different from his original outlaws—men of consideration, and tried warriors, from various tribes. The contest between him and Saul now assumed the dignity of a civil war. It was only closed by the death of the latter, whereupon D. ascended the throne of Judah, with the city of Hebron as his capital. The other tribes elected Ishbosheth, a son of Saul, to be their king, after whose murder D. first acquired possession of the entire kingdom, over which he ruled from 1055 until his death in 1015 B.C. His first undertaking in his new office was a war against the Jebusites. He took their chief city, Jerusalem, and made it his residence, as also the centre of the religious worship of the Hebrews. Subsequently, he subjugated the Philistines, Amalekites, Edomites, Moabites, Ammonites, and, after a long war, the Syrians. His kingdom now stretched from the Euphrates to the Mediterranean, and from Syria to the Red Sea, and contained a population of 5,000,000. He fostered navigation and trade, especially with Tyre, and sought to instruct the Hebrews in the arts. No less careful was he of the religion of his countrymen. He divided the priests and Levites into classes, and appointed sacred singers and poets for the musical service of God. Law and justice likewise received improvements at his hands, through the institution of higher and lower judiciary courts, while he secured the stability of his power by the formation of a standing army. Besides this, there were twelve governors over the tribes of Israel, 'who may perhaps be compared to the lord-lieutenants of English counties.' D. was not, however, without his trials. Two conspiracies were formed against him in his own family, and although both failed, they greatly imbittered his life. His sensual excesses also drove him into acts of criminality, the memory of which haunted him for ever. 'My sin is continually before me.' Yet we cannot help recognising in the man, in spite of all his errors and sins, a sincerity of moral feeling rarely equalled in history. His passions might lead him astray, but they never blinded his conscience. The crime once committed, D. never tried to find excuses for it, and so blunt the edge of his deserved misery. The psalms which he has left reveal to us the naked soul of the royal poet wrestling with a host of black troubles, fears, and doubts, out of which, however, as from the seething bosom of chaos, there emerges at last a 'full-orbed faith,' made perfect by suffering and much tribulation. There has never been trust in God more clear, unwavering, and tender than that expressed in the 23d Psalm. It is this many-sided experience of life that has made the 'Psalms of David' (though it is uncertain who made the collection, which contains many not written by David himself) the most precious heritage of the afflicted and tried in all ages of the Christian Church.—By those theologians who look upon Jewish history as having a *typical* or *allegorical* meaning as well as a literal one, D. is regarded as a type of Christ.

**DAVID I.** (often called ST DAVID), king of Scotland, was the youngest of the six sons of King Malcolm Ceanmohr, by his second wife, the Anglo-Saxon princess, St Margaret (q. v.). He was born about the year 1080. During the fierce struggle for the Scottish crown, which followed the death of his father in 1093, the youthful D. seems to have found refuge in England, along with his sister, Eadgyth or Matilda, who, in 1100, married Henry I., king of England. The residence of D. at the court of this accomplished monarch would appear to have been prolonged for several years, and the assertion of a contemporary English annalist may well be credited, that 'it freed him from the rust of Scottish barbarity.'

In 1107, his elder brother, Alexander, succeeded to the throne, and D. became Prince of Cumbria, a territory which comprised what are now the shires of Cumberland, Dumfries, Roxburgh, Selkirk, Peebles, Lanark, Dumbarton, Renfrew, and Ayr, and was held of the English king by the heir of the king of the Scots. Along with this great principality, he seems to have held lands in Lothian; and by his marriage in 1110 with Matilda, widow of the Earl of Northampton, he acquired possession of that earldom, together with a claim to the rest of the vast domains of her father, Waltheof, Earl of Huntingdon, of Northampton, and of Northumberland. The first act of D., as Prince of Cumbria, was to restore the fallen bishopric of Glasgow, which he committed to the charge of his old preceptor, John. His next act was to bring a colony of Benedictine monks from the newly founded monastery of Tiron, in France, and to plant them beside his forest castle of Selkirk. This was in 1113; and even thus early, as his charters shew, he had gathered round him the Bruces, the Lindsays, the Morvilles, the Umfravilles, the Percies, the Riddels, and other Anglo-Norman knights, through whose help he was to effect such a momentous change in Scotland.

In 1124, he succeeded to the Scottish throne, on the death of his brother, King Alexander I. That prince had had to fight for his crown against the heirs of the old Celtic dynasties, supported by the wild tribes of the north and the west. They renewed the struggle with his successor, first in 1130, when they advanced almost to the gates of Brechin; and again about twenty years later, when they appear to have been encountered on the plains of Murray. On both occasions, the Anglo-Norman chivalry with which D. had garrisoned the southern provinces, gave him decisive, but far from easy victories. He was less fortunate in his wars beyond the Tweed. In 1127, he had sworn, along with the other great barons of England, to maintain the right of his niece, Matilda, as heir of the English crown, should her father, Henry I., die without male issue of his own body. The event thus contemplated came to pass in 1135; and when Stephen mounted the English throne, D. took arms in behalf of Matilda, and subdued almost all the country to the south of Durham. Peace was restored by the grant of the earldom of Huntingdon, and the promise of the earldom of Northumberland, to D.'s son Henry, then in his 20th year. But the war was soon resumed; and in 1138, the king of Scots, deserted by Bruce and others of his Anglo-Norman vassals, was signally defeated in 'the Battle of the Standard,' near Northallerton. The next year, a second peace was concluded between the two kings, when the promised earldom of Northumberland was bestowed on D.'s son Henry. In 1141, the Scottish king marched into England for the third time to assert the rights of Matilda. He was a third time defeated, and only regained his own country with difficulty.

The rest of his reign was devoted to the accomplishment of the great revolution which had been begun by his father, King Malcolm, and his mother, St Margaret, and continued by his brothers, King Edgar and King Alexander—the establishment in Scotland of the civilisation which obtained in England. By building castles, he secured the peace and safety of the country; by erecting burghs, he promoted its trade, shipping, and manufactures, and laid the foundations of its freedom; by endowing bishoprics and monasteries, he provided homes for the only men of learning and enlightenment known in his time. His descendant, King James I., standing by his tomb in Dunfermline, is said to have complained that 'he was ane sore sanct for the crown;' but the remark, if it was ever made, would only shew that the sloth and ignorance of the clergy in the 15th c. had blotted out the remembrance of the great services which they rendered to mankind in the 12th c., when they were the schoolmasters, the statesmen, the lawyers, the physicians, the bankers, the engineers, the artists, the builders, the glaziers, the agriculturists, and the gardeners of the age. One who was a hard judge of monarchs—the great scholar, Buchanan—said with much more truth, 'that if men were to set themselves to draw the image of a good king, they would fall short of what David shewed himself throughout the whole course of his life.'

King D. died at Carlisle on the 24th May 1153. His son Henry had died in the previous June, and he was succeeded by his grandson, Malcolm, then in his twelfth year. The oldest Scottish painting now known to exist—an illuminated charter to the monks of Kelso, written in 1159—preserves rude miniatures of the young king and his saintly grandfather. It is engraved in facsimile in the *Liber S. Marie de Calchou*, presented to the Bannatyne Club by the Duke of Roxburghe in 1846. Some pleasing traits of King D.'s personal character —which seems to have been in many ways truly admirable—are preserved in the *Eulogium Davidis Regis Scotorum*, by his friend St Ailred, abbot of Rievaux, printed in Pinkerton's *Vitæ Antiquæ Sanctorum Scotiæ* (Lond. 1789). Other instructive materials for the king's life are supplied by the same writer in his tract *De Bello Standardi*, printed (together with other contemporary accounts of the battle) in Twysden's *Historiæ Anglicanæ Scriptores Decem* (Lond. 1652); and by Joceline of Furnes in his *Vita S. Walthevi* (abbot of Melrose, and D.'s stepson), printed by the Bollandists in the *Acta Sanctorum*, and in a less perfect state in Fordun's *Scotichronicon*. The remains of D.'s legislation, including the interesting code of the *Leges Burgorum*, have been carefully collected in the first volume of *The Acts of the Parliaments of Scotland* (Edin. 1844).

King D. is often called St David. He was never formally canonised, or placed in the roll of saints of the Roman Catholic Church; but his name was inserted in the calendar prefixed to King Charles's Prayer-book for Scotland, printed at Edinburgh in 1637.

**DAVID II.** See BRUCE.

**DAVID, FÉLICIEN**, a French composer, was born 8th March 1810, at Cadenet, in the department of Vaucluse. He was at first a chorister in the cathedral of Aix, and at the age of twenty entered the Paris Conservatoire. He threw himself earnestly into the social speculations of his day; became an ardent disciple of St Simon, and afterwards of Enfantin; and finally, on the break-up of the brotherhood attempted at Ménilmontant in 1832, he betook himself, along with eleven of his fellow-dreamers, to the East, there to realise his theory of life in undisturbed peace. The little knot of enthusiasts reached Constantinople, whence they made their way to Smyrna and Cairo. As they had no means, they suffered greatly from want, sickness, and ill-usage. The plague forced them to flee from Egypt, through the desert, to the coasts of Syria. It is said that they dragged a piano with them over the sands, and often, when they rested on their toilsome march among the wild tribes of the wilderness, D., whose ear was quick to catch the native airs of the East, sent forth enchanting strains from the instrument, and made his comrades forget their misfortunes. In 1835, he reached France, and published his *Mélodies Orientales* for the pianoforte. They were unsuccessful; and D. remained in obscurity till 1844, when he brought out at the Conservatoire his *Désert*, a grand *Ode-symphonie*, as he called it, the words of which were furnished by his friend and fellow-wanderer, M. Auguste Colin. Its success was sudden and complete. D. was declared a master at once, and his *Désert* was performed in all the theatres. Subsequently, he travelled through Belgium and Germany, and was everywhere greeted with applause; his imitation of the scenes of nomadic life being considered as perfect as music could achieve. D.'s later works, however, have not sustained the reputation he acquired by his *Désert*. The principal are—*Moïse sur le Sinaï* (1846), *Christophe Colombe*, and *Le Paradis* (1847), and a comic opera entitled *La Perle du Brésil* (1851).

**DAVID, JACQUES LOUIS**, the founder of the modern French school of painting, and, according to his countrymen, 'the regenerator of French art,' was born at Paris, 30th August 1748, and studied under Vien both at Paris and Rome. His first efforts by no means indicated the latent tendencies of his mind. His devotion to the classic style of art was first perceptible to any extent after his second visit to Rome in 1784, where he executed his 'Horatii.' It excited the greatest enthusiasm. In 1787, he painted 'The Death of Socrates;' in 1788, 'The Loves of Paris and Helen;' and in 1789, 'Brutus condemning his Son.' During the Revolution, he was artistic superintendent of those grand national fêtes and solemnities that recalled (but rather theatrically) the customs of ancient Greece. As a member of the Convention, he voted for the death of Louis XVI.; he was a hot Jacobin, and a member of the Committee of Public Safety, in all the atrocities of which he shared, and, in consequence, was twice imprisoned after the fall of Robespierre. To the period of the Revolution belong his 'Murder of Marat,' 'Murder of Pelletier,' and his 'Oath taken in the Tennis Court.' His genius culminated in the 'Rape of the Sabines' (1799). In 1804, Napoleon appointed him his first painter, and gave him a number of commissions, and among his best and most celebrated works are several historic portraits of the emperor, such as 'Napoleon crossing the Alps.' D. was warmly attached to Napoleon, and in 1814, when the Duke of Wellington paid a visit to his studio, and expressed a wish that the artist would paint his portrait, he coldly replied: 'I never paint Englishmen.' As one of the regicides of Louis XVI., he was banished in 1816 from France, and he died in exile at Brussels, December 29, 1825. D.'s later style is more free and natural than his earlier, in which his figures, although manifesting quite an ideal beauty of form, have all the rigidity of sculpture, and lack that vital expression which creates a sympathy in the mind of the beholder. Among the paintings executed by him during his banishment were—'Love and Psyche,' 'The Wrath of Achilles,' and 'Mars disarmed by Venus.' The number of his pupils who acquired distinction was very great.

**DAVID, PIERRE JEAN**, a French sculptor, commonly called David d'Angers, was born at Angers, 12th March 1789; went to Paris when very young; and studied art under his namesake, Jacques Louis David (q. v.). In 1811, his 'Death of Epaminondas' obtained the first prize for sculpture given by the Academy of Arts. D. now visited Rome, where he formed a friendship with Canova. In 1816, he returned to France. A statue of the Great Condé, which he executed about this time, established his reputation. In 1826, he was named a member of the Institute, and appointed a professor in the School of the Fine Arts. Two years later, he went to Germany, where he executed a colossal bust of

Goethe for the library at Weimar; and in a second tour in 1834, similar busts of Dannecker, Schelling, Tieck, and Rauch, as well as many portrait-statues of life-size. During the July revolution, D. had fought in the ranks of the people, and, in consequence, he was employed by the new government to execute the frontispiece of the Pantheon in 1835. He finished it in 1837. By many it is considered his *chef-d'œuvre.* In 1848, the well-known republicanism of the artist procured for him the honour of a seat in the Constituent Assembly. After the *coup-d'état,* he was sent into exile, and went to Greece, but soon after returned to France. He died 5th January 1856. It would be impossible to enumerate all D.'s works. The principal are—'A Young Girl at the Tomb of Botzaris,' 'A Monument of Bonchamp,' 'A Virgin at the Foot of the Cross,' a 'Saint John,' statues of General Foy, Marshal St Cyr, Corneille, Fénelon, and Racine, and busts of La Fayette, Béranger, Rossini, Chateaubriand, Balzac, and Casimir Delavigne. There is great force of expression in many of D.'s works, but the drawing and execution are not always accurate.

**DAVID,** or **DEWI,** St, the patron saint of Wales, was, according to tradition, the son of the Prince of Ceretica (Cardiganshire), and was born about the end of the 5th or beginning of the 6th century. Having resolved on a religious life, he spent, as was customary in those days, a probationary period in solitude, after which he commenced preaching to his countrymen. He built a chapel at Glastonbury, and founded twelve monasteries, the chief of which was at Menevia, in the vale of Ross. At the synod of Brevy, in Cardiganshire, held in 519, St D. shewed himself a strong opponent of the Pelagian heresy. Subsequently, he became Archbishop of Caerleon-upon-Usk, but transferred his see to Menevia, now called St Davids, where he died about the year 601. St D. was celebrated for his eloquence and success in conversion. Several works have been ascribed to him, but these are no longer extant. His life was written by Ricemarch, Bishop of St David's, who died about the year 1099. The *Historia S. Davidis,* by Giraldus Cambrensis, written about 1175, and published in Wharton's *Anglia Sacra,* is little more than an abridgment of Ricemarch's work.

**DAVID,** a town on the left bank of a river of the same name, is situated near the south-west extremity of Veragua, the most westerly province of New Granada, and lying on the frontier of Costa Rica, in Central America. D. is in lat. 8° 23′ N., and long. 82° 27′ W., and is separated by a comparatively narrow part of the Isthmus of Darien from the lagoon of Chiriqui, an inlet of the Caribbean Sea, which, with sufficient depth for large ships, penetrates nearly 50 miles into the land towards the Pacific Ocean. To this position the place appears to owe its prosperity. Though of recent origin, it numbered, in 1843, 4321 inhabitants, with a constant and regular immigration. It exports rice, coffee, hides, turtle, shells, and gold-dust. Its climate is understood to be comparatively salubrious.

**DAVIDS,** St, an ancient but now decayed episcopal city, in the west of Pembrokeshire, the westmost town in Wales. It is situated on the streamlet Allan, a mile from its mouth, near St David's Head, on the north side of St Bride's Bay. It has been the seat of a bishopric since about 519, when St David transferred the archbishop's see to St D. (before called Mynyw, and by the Romans Menevia) from Caerleon. It was in the middle ages a large city—the great resort of pilgrims to St David's shrine; it is now a small village, with only a few good houses, besides those of the clergy. It has a fine cathedral, and splendid remains of religious houses, episcopal palace, and St Mary's College (founded by John of Gaunt), within a high embattled wall nearly a mile in circuit. These were several times pillaged and burned by the Danes and others during the 9th and two following centuries. The cathedral, founded in 1180, on the site of the monastery of St David, is cruciform. Its dimensions, in the interior, are as follows: length, 290 feet; breadth, 76; nave, 124; choir, 80; transept, 120; central tower, 127 feet high. It contains a curious movable pulpit, an elaborately worked bishop's throne; the tomb of the Earl of Richmond, father of Henry VII.; and also sepulchral monuments of the early bishops of the see, as Giraldus Cambrensis, Anselm, &c. Among the former bishops, may be named Laud, Bull, South, and Horsley. The present occupant of the see is Connop Thirlwall, the historian of Greece. The cathedral establishment includes a bishop, a dean, four canons, five vicars choral, and other officers residentiary, with four archdeacons, and 12 prebendaries, or honorary canons, non-resident. The bishop has £4500 a year, and lives at Abergwili, near Caermarthen. Pop. (1861) 1500, chiefly agricultural labourers. William the Conqueror made an offering as a pilgrim at St David's shrine. Cairns, tumuli, holy wells, chapels, crosses, &c., abound around St D., and especially at St David's Head, a high rugged promontory two miles north-west of the city, and the westmost point in Wales, in lat. 51° 54′ N., and long. 5° 20′ W.

**DA'VIES,** Sir John, a poet and statesman of some reputation, was the son of a legal practitioner in Wiltshire, and was born in 1570. At the age of 15 he was sent to Queen's College, Oxford, where, five years after, he took his degree of B.A., having spent two of these years in the Middle Temple, where he studied law. He was called to the bar in 1595, but forfeited his privileges, and eventually was expelled from the Temple on account of certain indiscretions. He began his political career in 1601. In 1603, he was sent by James I. as solicitor-general to Ireland, and almost immediately after, he became attorney-general. He was called to the degree of sergeant-at-law in 1606, and in the spring of the following year received the honour of knighthood. On the assembling of the Irish parliament, called in 1613, D. was chosen Speaker of the House of Commons. In 1620, he took his seat in the English parliament as member for Newcastle-under-Lyne. He died suddenly of apoplexy, December 7, 1626.

As a lawyer, the character of D. is that of a man of great learning and talent. His *Reports of Cases adjudged in the King's Courts in Ireland,* published in 1615, were the first reports of Irish cases ever published, and had a preface from the pen of D., which was esteemed by an old critic as the best that was ever prefixed to a law-book. But it is as a poet that he is chiefly notable. His *Orchestra, or a Poem on Dancing* (1596), was followed by his great work, the *Nosce Teipsum, a Poem on the Soul and the Immortality thereof* (1599). His verse is elegant without being artificial, and flowing without being careless, while its compact structure is remarkable for his times. Among his miscellaneous works may be mentioned his *Discovery of the True Cause why Ireland was never Subdued entirely until the Reign of King James I.* (Lond. 1612), a work which has always been considered of great value to political inquirers.

**DA'VILA,** Enrico Caterino, a celebrated Italian historian, was born at Pieve di Sacco, in the vicinity of Padua, October 30, 1576. D., when seven years old, was taken to France for his education. At the age of 18, he entered the service of Henry IV., which he afterwards exchanged for the military service of Venice. On his way to Crema, to take command of the garrison, in 1631, he was shot by a postmaster on the road, with whom he had quarrelled. D. has been rendered famous by his great work, entitled *Storia delle Guerre Civili di Francia* (History of the Civil Wars in France), (Venice, 1630), comprising that eventful period from the death of Henry II., 1559, to the peace of Vervins in 1598. D. is universally regarded as one of the best historical writers of Italy.

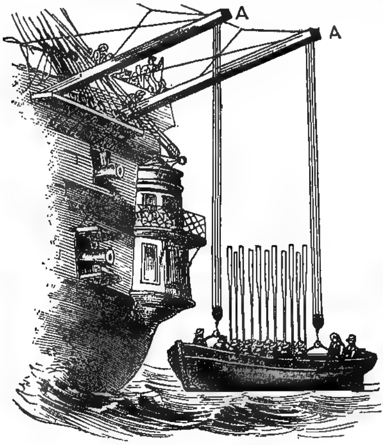
**DAVIS, Jefferson**, a political character noted in the modern history of the United States of America, first made himself conspicuous as a member of the House of Representatives, and afterwards of the National Senate, in which he represented the state of Mississippi. At the commencement of the Mexican war he left Congress, and engaged actively in the contest. Having the advantage of a military training, and having served in the regular army, he soon acquired distinction. When Pierce was elected president in 1853, D. was appointed secretary of war, and at this period he exercised a powerful influence in the administration—ruling, in fact, the president as well as the greater number of the members of the cabinet. When Buchanan became president, he left the cabinet, but was returned to the senate by the legislature of Mississippi, which position he retained till the secession of his state. On the 18th February 1861, the southern states, which had previously passed votes professing to secede from the Union on account of the election of Mr Lincoln to the presidency, formally appointed D. to be *their* president at Montgomery, Alabama.

**DAVIS, John**, an eminent navigator of the latter part of the 16th c., was born at Sandridge, near Dartmouth, and is principally distinguished for having, between 1585 and 1588, undertaken three voyages to the northern seas in search of a north-west passage. In the first voyage, he sailed as far north as the 73d degree of latitude, and discovered the strait which bears his name. He afterwards made five voyages to the East Indies, in the last of which he was killed in a fight with some Japanese on the coast of Malacca. This event took place in 1605. He is the author of several works, among which the chief are—*The World's Hydrographical Description, wherein is proved that the World, in all its Zones, Climates, and Places, is Habitable and Inhabited, and the Seas likewise universally navigable* (Lond. 1595); and *The Seaman's Secrets, wherein is taught the Three Kinds of Sailing, Horizontal, Paradoxal, and Sailing upon a Great Circle*, 8vo (Lond. 1595).

**DAVIS, Sir John Francis, Bart.**, born in London 1795, long resident in China as chief superintendent of Canton, and afterwards as governor and commander-in-chief of the colony of Hong-kong, is one of the best and most trustworthy authorities on China and the Chinese. In 1845, D. was created a baronet, and received the order of Knight Grand Cross of the Bath in 1854. Sir Francis D. is deputy-lieutenant of the county of Gloucester. His *China, during the War and since the Peace*, appeared in 1852, and was followed in 1857 by his *China, a General Description of that Empire.*

**DA'VIS' STRAIT**, so called from the navigator who discovered it, forms the southern part of that inlet of the Atlantic which washes the western coast of Greenland. It thus connects Baffin's Bay, and also, in some sense, Hudson's Strait, with the open ocean. At its narrowest point, it measures 160 miles across. It is largely frequented by whaling-ships. A constant current, bringing with it, of course, much ice, flows down D. S. from the circumpolar waters. Recently, however, it has been maintained, on apparently good grounds, that, on the eastern side, an opposite current, similarly freighted, sweeps round Cape Farewell, on its way from Spitzbergen.

**DA'VIT**, in Ship-building, is a piece of timber projecting over the bow or front-part of a vessel, and used as a crane for hoisting the anchor out of the water clear of her bow; two such pieces of timber or iron on her side, or stern, are used for hoisting or lowering the boats.



A, A, Davits.

**DAVOUT** (not Davoust, as commonly written), Louis Nicolas, a French marshal, was born 10th May 1770, at Annoux, in the old province of Burgundy; was educated along with Bonaparte at the military school of Brienne; and in 1785, became sub-lieutenant in a cavalry regiment. During the revolutionary wars, he rose to the rank of general. He accompanied Bonaparte to the East, where he mainly contributed to the victory at Aboukir, and otherwise distinguished himself both in Upper and Lower Egypt. On his return to France, he was named general of division in 1800, commander-in-chief of the consular grenadier guards in 1801, and marshal of the empire in 1804. In the campaigns of 1805, 1806, and 1807, he acted a brilliant part in the great victories obtained by the French at Ulm, Austerlitz, Jena, Auerstadt, Eylau, and Friedland. In reward of his bravery, Bonaparte created him Duke of Auerstadt (July 2, 1808). On the renewal of the war with Austria in 1809, D.'s star was again in the ascendant, and he was created Prince of Eckmühl for his services at the battle of Eckmühl. At Wagram, he performed prodigies of valour. Appointed governor of Poland, he ruled that country in a spirit of the harshest despotism, and provoked the reproaches of the emperor, but, nevertheless, did not change his system. In the Russian campaign of 1812, he gathered fresh laurels on the fields of Mohilow and Borodino. After the retreat from Moscow, D. became governor-general of the Hanse towns, and established himself at Hamburg, where he gallantly maintained himself till the first restoration of the Bourbons. On the return of Bonaparte from Elba, D. was appointed war-minister, and in this office shewed a remarkable genius for the rapid organisation of troops and supplies. After the battle of Waterloo, he received the command of the relics of the French army under the walls of Paris. He would have continued the contest, had he not been ordered by the Provisional Government in the capital to conclude a military convention with the allies. In 1819, he was made a peer of France. His death took place June 1, 1823. Firmness of character and dauntless courage were D.'s leading characteristics; but his military severities often went the length of harshness, and even cruelty, while his rapacity had in it something akin to barbarism.

**DAVY, Sir Humphry,** one of the greatest chemists of his own or of any age, was born on the 17th December 1778, at Penzance, in Cornwall, where his father was a carver in wood. At the school of Truro, where he was educated until he was 15, he shewed little relish for classical learning, but he was distinguished for a highly retentive memory and an early passion for poetry, which never forsook him. Another prominent trait of his character was equally early developed: as a child, he would angle even in the gutters of the streets; and only two years before his death, and after his health had given way, he published his interesting volume, *Salmonia, or Days of Fly-fishing.* Soon after leaving school, he became apprentice to a surgeon and apothecary in Penzance. He at the same time entered upon a course of study all but universal. 'Speculations on religion and politics, on metaphysics and morals, are placed in his note-books in juxtaposition with stanzas of poetry and fragments of romance.' A system of mathematical study, sceptical philosophy, Scotch metaphysics and German transcendentalism, successively engaged his attention. The study of natural philosophy brought him nearer to that department which was to be his own; but it was not till he had reached his 19th year, that he entered seriously upon the study of chemistry. He now made the acquaintance of Dr Beddoes, who had established a Pneumatic Institution at Clifton, and who took him as his assistant. Here D. carried on a course of experiments on the respiration of different gases, in which he had more than once nearly sacrificed his life. He thus discovered the singular exhilarating effect of nitrous oxide when breathed. The account which he published of his researches, established his reputation, and led to his appointment, at the age of 22, as lecturer to the Royal Institution of London. He delivered his first lecture in 1801; and his eloquence, and the novelty and variety of his experiments, soon attracted crowded and brilliant audiences. In 1803, he began researches connected with agriculture, on which he delivered a course of lectures. These were published in 1813, under the title of *Elements of Agricultural Chemistry*, and form an era in that science. The discoveries, however, on which D.'s fame as a chemist chiefly rests, took their origin in the views which he developed in 1806, in his Bakerian lecture, *On some Chemical Agencies of Electricity.* This essay was universally regarded as one of the most valuable contributions ever made to chemical science, and obtained the prize of the French Institute. Following out his principle, he was led to the grand discovery, that the alkalies and earths are compound substances formed by oxygen united with metallic bases. It was potash that he first succeeded in decomposing, on the 8th October 1807. When he first saw the globules of the new metal, *potassium*, his delight is said to have been so ecstatic that it required some time for him to compose himself to continue the experiment. He next decomposed soda and the alkaline earths, baryta, strontia, lime, and magnesia; and discovered the new metals, *sodium*, *barium*, *strontium*, *calcium*, and *magnesium*. With regard to the earths proper, he succeeded in proving that they consist of bases united to oxygen. It was reserved for Wöhler and others to exhibit the bases by themselves.

In 1812, D. was knighted, married a lady of considerable wealth, and resigned the chemical chair of the Royal Institution. That he might investigate his new theory of volcanic action, he received permission from the French government—though the two countries were then at war—to visit the continent, and was received with the greatest distinction by the scientific men of France. On returning to England in 1815, he entered on the investigation of the nature of fire-damp, which is the cause of explosions in coal-mines. This resulted in the invention of the safety-lamp (q. v.)—one of the most valuable presents ever made by science to humanity. Though the value of the invention was everywhere acknowledged, the only national reward was a baronetcy after a lapse of three years. This has been contrasted with the pension of £1200 a year bestowed by the same government on Sir William Congreve for the invention of his rocket. On the death of Sir Joseph Banks, in 1820, Sir Humphry D. was elected President of the Royal Society. His attention was shortly after called to the important object of preserving the copper-sheathing of vessels from corrosion by the action of sea-water. This he effected by altering the electric condition of the copper by means of bands of zinc; but the bottoms of the vessels became so foul from the adhesion of weeds, shells, &c., that the plan had to be abandoned.

Early in 1825, Sir Humphry D. had begun to complain of the loss of strength, and, in 1826, he had a paralytic attack affecting his right side. He made two journeys to the continent for the recovery of his health, and died at Geneva on the 29th May 1829, at the early age of 51. The Genevese government evinced their respect by a public funeral. So widely spread was the reputation of Sir Humphry D., that he was a member of almost all the scientific institutions in the world. Cuvier, in his *Eloge*, says: 'Mr Davy, not yet 32 years of age, occupied, in the opinion of all that could judge of such labours, the first rank among the chemists of this or of any other age.' Besides the works already mentioned, and a great number of contributions to the Philosophical Transactions, Sir Humphry D. published *Elements of Chemical Philosophy* (Lond. 1812); and *Consolations in Travel, or the Last Days of a Philosopher* (3d ed. Lond. 1831), appeared after his death. See *Memoirs of the Life of Sir Humphry D.*, by his brother (Lond. 1836, 2 vols.); and *The Life of Sir Humphry D.*, by Dr Paris (Lond. 1831).

**DAVY'S SAFETY-LAMP.** See Safety-lamp.

**DAWA'LLA** (*Hypophthalmus dawalla*), a fish of the family *Siluridæ*, found in the rivers of Guiana, and highly esteemed for the delicacy of its flesh. It is sometimes two feet and a half long, and has a snout somewhat like that of a pike, but the mouth is furnished only with very minute teeth. The skin is destitute of scales, and the colours have that brightness so often seen in tropical fishes, green, brown, and carmine. The D. has become shy in the waters of the more populous and long-settled parts of Guiana, although easily captured in more remote regions.

**DAWK, or DAK,** a method of travelling in India which consists in posting by palanquin from station to station, or for any distance. The traveller must first purchase a strong palanquin, which he can have for from 40 to 100 rupees (£4 to £10), but which he can always dispose of when his journey has been completed, and generally at a profit. His clothes, together with whatever articles he may not immediately need, are carried in tin-boxes or wicker-baskets called *pettarahs*, by separate bearers, who precede or accompany the palanquin; whatever he considers necessary, however, he keeps beside himself inside. At all the stages, which are from 9 to 11 miles apart, there are relays of bearers, previously provided by the postmaster, the usual number for one palanquin being eleven. All arrangements as to cost are made with the postmaster of each presidency before starting, but the traveller is also expected to give some small sum to his bearers at the end of each stage: eight annas (one shilling) among the entire set of bearers is as much as is expected in the way of gratuity. The Horse-dawk, a kind of carriage with seats for four, and capable of being used as a bed in which two can sleep, the baggage being conveyed on the top, set on wheels, and drawn by horses, is in use on the great trunk road from Calcutta to the upper provinces, but has not been established throughout the country generally.

**DAW'LISH**, a flourishing and picturesque watering-place, on the south coast of Devonshire, 12 miles south of Exeter. It lies in a valley running east and west between the mouths of the Exe and Teign. It has recently built public-baths. Pop. (1861) 4014.

**DAWN.** See TWILIGHT.

**DAX**, a town of France, in the department of Landes, pleasantly situated on the left bank of the Adour, 20 miles north-east of Bayonne. Among its principal buildings are the high church, once a cathedral, and the bishop's palace. It is an intermediate dépôt for goods forwarded to Spain, and has some manufactures of earthen-ware, wine, and brandy; but it is chiefly remarkable for its hot saline springs, the temperature of which at the source is 212° F. The water, which is medicinal and nearly tasteless, was used for bathing-purposes by the Romans, who conferred upon the springs the name Aquæ Augustæ Tarbellicæ. Pop. 5801.

**DAY** (probably allied to the Lat. *dies*, day, *divum*, the sky, from the root *div*, to shine) originally meant the space of time during which it is light, in opposition to the space of darkness or night; it now more usually denotes a complete alternation of light and darkness. It is the earth's rotation that causes the vicissitude of day and night. The earth being a globe, only one-half of it can be in the sun's light at once; to that half it is day, while the other half is in its own shadow, or in night. But by the earth's rotation, the several portions of the surface have each their turn of light and of darkness. This happens because the position of the earth is such that the equator is on the whole presented towards the sun; had either pole been towards the sun, that hemisphere would have revolved in continual light, the other in continual darkness.

One complete rotation of the earth does not make a day, in the usual sense. If the time is noted when a particular fixed star is exactly south or on the meridian, when the same star comes again to the meridian the next day, the earth has made exactly one rotation, and the time that has elapsed is called a *sidereal day*. This portion of time is always of the same length; for the motion of the earth on its axis is strictly uniform, and is, in fact, the only strictly uniform motion that nature presents us with. Sidereal time, or star-time, from its unvarying uniformity, is much used by astronomers. But the passage of a star across the meridian is not a conspicuous enough event for regulating the movements of men in general. It is not a complete rotation of the earth, but a complete alternation of light and darkness that constitutes their day. This, which is called the *civil* or the *solar* day, is measured between two meridian passages of the sun, and is about four minutes longer than the sidercal day. The cause of the greater length is this: When the earth has made one complete turn, so as to bring the meridian of the place to the same position among the fixed stars as when it was noon the day before, the sun has in the meantime (apparently) moved eastward nearly one degree among the stars, and it takes the earth about four minutes more to move round so as to overtake him. If this eastward motion of the sun were uniform, the length of the solar day would be as simple and as easily determined as that of the sidereal. But the ecliptic or sun's path crosses the earth's equator, and is therefore more oblique to the direction of the earth's rotation at one time than another; and besides, as the earth moves in her orbit with varying speed, the rate of the sun's apparent motion in the ecliptic, which is caused by that of the earth, must also vary. The consequence is, that the length of the solar day is constantly fluctuating; and to get a fixed measure of solar time, astronomers have to imagine a sun moving uniformly in the celestial equator, and completing its circuit in the same time as the real sun. The time marked by this imaginary sun is called *mean solar time;* when the imaginary sun is on the meridian, it is *mean noon;* when the real sun is on the meridian, it is *apparent* noon. It is obvious that a sun-dial must shew apparent time, while clocks and watches keep mean time. Only in four days of the year do these two kinds of time coincide. In the intervals, the sun is always either too fast or too slow; and the difference is called *the equation of time*, because, when added to or subtracted from apparent time, it makes it equal to mean time. The mean solar day is divided into twenty-four hours, the hours into minutes and seconds. A sidereal day, we have seen, is shorter; its exact length is 23 hours, 56 minutes, 4 seconds of mean solar or common time. Astronomers divide the sidereal day also into twenty-four hours, which are of course shorter than common hours. In the course of a civil year of 365 days, the earth turns on its axis 366 times, or there are 366 sidereal days. Astronomers reckon the day as beginning at noon, and count the hours from 1 to 24. The civil day begins at midnight, and the hours are counted in two divisions of twelve each. The ecclesiastical day was reckoned from sunset to sunset.

*A day, in law*, includes the whole twenty-four hours, without any reference to the season of the year, or the amount of light or darkness. Where there is no qualifying stipulation, therefore, the obligation to pay on a certain day is discharged, if the money be paid before twelve o'clock at night, or the commencement of the following day. On the same principle, if anything is to be done within a certain time from or after the doing of a certain other thing, the day on which the first act or occurrence takes place is excluded. If A binds himself to pay money ten days after B's death, and B dies on the 1st, the money will not be due till the night of the 11th at twelve o'clock. Where it is not absolutely necessary, for the purposes of justice, the law excludes fractional portions of time; thus, half a year consists of 182 days, and a quarter of a year of 91.

A *lawful day* is a day on which there is no legal impediment to the execution of a writ—i. e., all days except Sundays and fast-days appointed by government. Criminal warrants are an exception to this rule, and may be both granted and executed on Sundays and fast-days. By 29 Car. II. c. 7, all contracts made by persons in their ordinary calling on a Sunday are void. The exceptions to this rule will be explained under Sabbath Observance. In England, Christmas-day, Good-Friday, and Easter-day, generally stand on the same footing with days appointed by royal proclamation for public fasting and humiliation; but in Scotland, there is no exception made in favour of any of the feast or fast days of the church.

*Days of Grace.* The time at which a bill is actually *due*, or *at maturity*, is in general three days after the time expressed on the face of it. The three additional days which are generally allowed by the custom of merchants, and which the laws of the United Kingdom recognise and protect, are called days of grace. If the third day of grace fall on a Sunday, or on a day of public fast or thanksgiving, or, in England, on Christmas-day or Good-Friday, the bill is due the day before. See Bill.

**DAY**, Thomas, a political writer and poet, was born in London, June 22, 1748, and studied at Oxford. The American war of independence, with which he strongly sympathised, seems to have roused his poetical energies. In 1773, he published *The Dying Negro;* in 1776, *The Devoted Legions;* and in 1777, *The Desolation of America.* But he is chiefly remarkable as the author of the famous *History of Sandford and Merton*, as also the *History of Little Jack.* He was killed by being thrown from a horse, 28th September 1789.

**DAYAKS.** See Borneo, and Brooke, Sir James.

**DAY-FLY.** See Ephemera.

**DAY-LILY** (*Hemerocallis*), a genus of plants of the natural order *Liliaceæ*, having a perianth with bell-shaped limb, and sub-cylindrical tube, and globose seeds with soft *testa.* Several species are cultivated in our flower-gardens, especially the fragrant Yellow Day-lily (*H. flava*), a native of Hungary, Siberia, and the north of China. It has also been recommended to farmers as affording a supply of a most acceptable green-food to cattle. But *H. fulva*, a native of the Levant, produces more abundant foliage, and cattle are equally fond of it. Both species are fibrous-rooted perennials with linear leaves.

Day-lily.

**DAY'SMAN**, a name formerly given in England (and still in use in some of the northern counties) to an arbitrator, umpire, or elected judge. It has its origin in the judicial language of the middle ages, when the word *Day* was specially applied to the day appointed for hearing a cause, or for the meeting of an assembly. A daysman was thus a judge appointed to decide between parties at a judicial hearing. The word occurs in Scripture, where Job sorrowfully says, in reference to his relation to God: 'Neither is there any daysman betwixt us, that might lay his hand upon us both' (Job ix. 33).

**DAY'TON**, the fourth city of Ohio in the United States with regard to population and wealth, stands at the confluence of the Miami and the Mad, in lat. 39° 44′ N., and long. 84° 11′ W. It is connected with Cincinnati, the commercial capital of the state, on the Ohio, by the Miami Canal—the distance being 52 miles; and it is the terminus of six railways, which radiate in every direction. In the variety and extent of its manufactures, D. stands foremost among western towns in proportion to its size. The population has very rapidly increased. In 1850, it amounted to 10,976, having almost quadrupled within the preceding 20 years; in 1853, it had risen to 16,562, shewing an addition of more than 50 per cent. in three years; while at the census of 1860 it amounted to 20,482.

**D'AZA'RA**, Don Felix, a very eminent naturalist, was born at Barbunales, in Aragon, 18th May 1746, was educated at the university of Huesca, obtained a commission in the Spanish army, was severely wounded in the attack upon Algiers, and in 1781 was appointed one of the commissioners for fixing the boundaries of the Spanish and Portuguese possessions in South America. He proceeded immediately to that country, and did not return to Spain till 1801, encountering many difficulties in the discharge of his duties, in which he shewed the greatest faithfulness and perseverance. He devoted himself also to the investigation of the geography, ethnology, and natural history of the regions in which he spent so many years, and published an account of his travels, and an important work on quadrupeds and birds, under the modest title of *Notes on the Natural History of Paraguay and La Plata* (Madrid, 1802, *et seq.*).—D.'s elder brother was eminent as a diplomatist.

**DEA'CON OF A TRADE**, the president, for the time being, of certain incorporations in Scotland; in which country, before the passing of the Burgh Reform Act (3 and 4 Will. IV. c. 76), the deacons of trades or crafts represented the trades in the respective town-councils. They were elected by the incorporations, but generally under the control of the town-council. The subordinate incorporation presented a list of six of its members to the town-council, by whom three of the names were struck off. The leet, thus shortened, was returned, in order that the deacon for the ensuing year should be chosen from it. By the act just referred to (s. 19), it is enacted that the deacons shall no longer be recognised as official and constituent members of the town-council, the power of the crafts to elect deacons and other officers for the management of their affairs being reserved (s. 21). This more limited privilege is now exercised independently of the town-council. The deacon-convener of the trades in Edinburgh and Glasgow (s. 22), is still a member of the town-council. One of the duties of the deacon in former times was to essay, or try, the work of apprentices, previous to their being admitted to the freedom of the trade. See Dean of Guild. After this explanation, it need hardly be added that these deacons have no connection with ecclesiastical affairs, and are in no respect to be addressed like deacons in a spiritual sense.

**DEA'CONS**, literally *servants*, meant, in apostolic times, properly those officers of a congregation or church that had the charge of collecting and distributing the alms, and of taking care of the poor and the sick. The office, therefore, was not a clerical one, though the term deacon or servant may have been at times applied to teachers as *minister* was, which has the same meaning. The limitations of the office of deacon to the functions above specified, continued to be recognised as late as the Council of Trullanam, 692. The Church of Jerusalem chose at first seven deacons, individuals of whom, no doubt, as Philip, also taught and baptised, but only because they were evangelists as well as deacons. The number seven continued to be adhered to in all churches. During the 2d and 3d centuries, the duties falling to the deacons had considerably increased; and since as confidential attendants and helpers of the bishops, they had risen into consequence, it became necessary to divide the various functions among an archdeacon, deacons, and subdeacons. Deacons might now dispense the bread and wine at the communion, but not consecrate them. They had to receive the offerings and presents for the bishop, to keep the sacred vessels, to chant the introductory formulas of public worship, and to take the oversight of the morals of the congregation; and they were allowed, in many cases, with the leave of the bishop, to preach and baptise, and receive penitents into the communion of the church. At an early period, the offices of archdeacon and deacon were considered to belong to the higher orders of consecration (*ordines majores*); this was not the case with that of subdeacon till after the 12th century. At the consecration of a deacon, the sacred vessels are handed to him as symbols of his office. The peculiar robes are the dalmatica and the stole. In Protestant churches, the position of deacons varies. Among Presbyterians, their place is usually supplied by the elders; but in some Presbyterian churches (e. g., the Free Church of Scotland), the offices of elder and deacon are kept distinct. In the Church of England, a deacon is a clergyman receiving a special form of ordination, but differing in effect from a regular priest only from not being allowed to consecrate the elements at the communion, or pronounce the absolution or benediction. For this, as well as for holding any benefice or church-preferment, priest's orders are necessary. The office is of little importance, except as affording an interval of probation before admission to priest's orders. Before a person can be appointed deacon in the English Church, he must have reached the age of 23, and he usually remains in this office one year at least.

DEA'CONESSES (*ancillæ, ministræ, viduæ, virgines, episcopæ, presbyteræ*), female ministers or servants of the church or Christian society in the time of the apostles (Rom. xvi. 1). They co-operated with the deacons, shewed the women their place in the church-assemblies, assisted at the baptism of persons of their own sex, instructed those who were about to be baptised as to the answers they should give to the baptismal questions, arranged the *agapæ* or love-feasts, and took care of the sick. In the 3d c., it seems to have been also part of their duty to visit all Christian females who were suffering imprisonment, and to be hospitable to such as had come from afar. In very early times, they were consecrated to their office by ordination in the same manner as other ecclesiastical or spiritual personages; later, however, they were inducted into their office by prayer without the imposition of hands. Until the 4th c., the D. had to be either maidens or widows who had been only once married, and 60 years of age; but after the Council of Chalcedon, the age was fixed at 40. Their assistants were called *sub-deaconesses.* After the 6th c., in the Latin Church, and after the 12th c., in the Greek Church, the office of deaconess was discontinued; but the former has retained the name. In monasteries, for example, the nuns who have the care of the altar are called deaconesses. In the Reformed Church of the Netherlands, also, those elderly females are called D. who take care of lying-in women and of the poor. The advantages resulting to a Christian community from such an order are too obvious to require exposition. It has been a serious misfortune to the church at large, that the office has been allowed to fall into disuse; and the wide-spread institution at the present day in the churches of Great Britain and America of Ladies' District-visiting Societies, Dorcas Societies, &c., satisfactorily shews the necessity of practically supplying, to some extent at least, the want of this primitive office. There is a movement going on at present for the introduction of the order of deaconesses into the Church of England.

**DEAD**, BURNING OF THE. See BURIAL.

**DEAD**, in Seafaring Language, is very frequently employed as part of a designation or phrase having, in general, a meaning somewhat opposite to that of *active, effective*, or *real.* The chief of such phrases are the following: *D. eyes* are circular, flattish wooden blocks, which, with other apparatus, form a purchase or tackle for extending the standing rigging and other purposes. *D. flat* is the name for one of the midship-timbers. *D. lights* are strong wooden shutters to close cabin-windows: on the approach of a storm, it is customary to take out the glass-windows, as being too fragile, and replace them with D. lights. *D. rising* is a name for that part of a ship's bottom where the floor-timbers terminate, and the lower futtocks or foot-hooks begin. *D. ropes* are such as do not run in blocks. *D. wood* consists of blocks of timber laid upon the keel, especially fore and aft; it is piled up, and fastened to the keel with iron spike-nails; the chief object is to give solidity and strength to the ends of the ship. To these may be added *D. wind*, a seaman's designation for a wind blowing directly against a ship's course.

**DEAD**, JUDGMENT OF THE (in ancient Egypt). The papyrus rolls found with the Egyptian mummies contain a description of the fate of the departed subsequent to their death. Even in the least complete specimens, the most important scene is seldom wanting—that, namely, in which the dead is led by the hand of Ma, the goddess of Truth and Justice, into the judgment-hall of the nether world, before Osiris, the judge of the dead. The god's throne faces the entrance. In the middle of the hall stands a huge balance, with an ostrich feather, the symbol of Truth, in one scale, and a vessel in the form of a human heart in the other. A female hippopotamus appears as accuser. Above sit forty-two gods, each of whom specially presides over one of the forty-two sins from which the deceased has to clear himself. The gods Horus and Anubis attend to the balance, while the ibis-headed Thoth-Hermes, the justifier, writes down the result, which is naturally assumed to be favourable. Such is the judgment of the dead in the Egyptian Hades. But, according to Diodorus, a human judgment had already been passed upon the departed previous to burial. Before the sarcophagus was launched upon the holy lake over which it was to be ferried by Charon, the friends and relatives of the dead, together with forty-two judges, assembled on the shore. Each was permitted to bring an accusation against him, and if it were proved, the solemnities of burial were withheld. A false accuser, however, was severely punished. Even unjust and unpopular monarchs were often deprived of sepulture by this process.

**DEAD**, Praying for the. See Prayer.

**DEA'D-FREIGHT**, the compensation paid by the merchant who freights a whole ship to the shipmaster for the space which he fails to occupy. It is rather a claim for damages for the loss of freight, than freight itself, and consequently, apart from positive stipulation, the shipmaster has no lien for dead-freight over the goods on board. His claim must, consequently, be made effectual by a personal action against the freighter.

**DEAD NETTLE** (*Lamium*), a genus of plants of the natural order *Labiatæ*, having a 5-toothed calyx and a 2-lipped corolla, the upper lip arched, the lower lip trifid. The name D. N.—popularly in some parts both of England and Scotland, *Dee Nettle*—is also often extended to the genera *Galeopsis* and *Galeobdolon*, genera very similar to *Lamium*, the first of which is sometimes distinguished by botanists as Hemp-nettle, the second as Weasel-snout. *Lamium purpureum*, *L. incisum*, *L. album*, and *Galeopsis tetrahit*, are very common British weeds, some of them appearing in almost every garden, cornfield, or piece of waste-ground. *L. purpureum* and *L. album* are sometimes boiled as pot-herbs in Sweden. It is probably to *G. tetrahit*, or *G. versicolor*, also very common in Scotland, much larger plants, and rough with strong hairs, rather than to any species of *Lamium*, that the popular belief relates of a power residing in the hairs of the D. N., particularly when the plant is dried, as in haymaking, of causing irritation in the hands of persons handling them, which, extending throughout the system, occasionally terminates in death. They do not, however, seem to possess any poisonous property. The subject is one perhaps deserving of more attention than it has received.

**DEAD-RE'CKONING**, a term in Navigation, signifying the calculation of a ship's place at sea, made independently of celestial observations. The chief elements from which the reckoning is made are: The point of *departure*, i. e., the latitude and longitude sailed from, or last determined; the *course* or direction sailed in (ascertained by the compass); the rate of sailing—measured from time to time by the Log (q. v.); and the time elapsed. The various principles or methods followed in arriving at the reckoning from these data are known as *plain-sailing*, *middle-latitude sailing*, &c. See Sailings. But the data themselves are liable to numerous uncertainties and errors, owing to currents, leeway (q. v.), fluctuations of the wind, changes in the declination of the compass, &c.; and therefore the results arrived at by the D. have to be corrected as often as is possible by observation of the heavenly bodies. See Navigation, Latitude, Longitude.

**DEAD SEA** (anc. *Lacus Asphaltites*), called by the Arabs Bahr Loot, or *Sea of Lot*, is situated in the south-east of Palestine, in lat. 31° 10′—31° 47′ N., and occupies a central position between long. 35° and 36° E. It is about 40 miles long, with an average breadth of 9 miles. The depth of the D. S. varies considerably: soundings in the north have given about 220 fathoms; this depth, however, gradually lessens towards the southern extremity, where the water is shallow. Its surface, which is lower than that of any water known, is 1312 feet below the level of the Mediterranean. The shape is that of an elongated oval, interrupted by a promontory which projects into it from the south-east. The D. S. is fed by the Jordan from the north, and by many other streams, but has no apparent outlet, its superfluous water being supposed to be entirely carried off by evaporation. Along the eastern and western borders of the D. S., there are lines of bold, and in some cases perpendicular cliffs, rising in general to an elevation of upwards of 1000 feet on the west, and 2000 feet on the east. These cliffs are chiefly composed of limestone, and are destitute of vegetation save on the east side, where there are ravines, traversed by fresh-water springs. The north shores of the lake form an extensive and desolate muddy flat, marked by the blackened trunks and branches of trees, strewn about, and incrusted with salt, as everything is that is exposed to the spray of the Dead Sea. The southern shore is low, level, and marshy, and desolate and dreary in the highest degree; the air is choking, and no living thing to be seen. On this shore is the remarkable mass of rock called Usdum (Sodom). It is a narrow rugged ridge of hill, extending five miles north-west, and consisting of rock-salt. Large blocks have broken off from this hill, and lie strewn in all directions along the shore, adding to its dreary and deathlike aspect. To the north of Usdum, and at no great distance, is the supposed site of the ancient Sodom. Although the hills surrounding the D. S. are principally composed of stratified rock, yet igneous rocks are also seen; there are also quantities of post-tertiary lava, pumice-stone, warm springs, sulphur, and volcanic slag, clearly proving the presence here of volcanic agencies at some period. The neighbourhood of the D. S. is frequently visited by earthquakes, on which occasions it has been observed that this lake casts up to its surface large masses of asphaltum, of which substance the cups, crosses, and other ornaments that are made and sold to pilgrims at Jerusalem chiefly consist. The long-entertained belief, that the exhalations from this lake were fatal, is not founded upon fact; birds have been seen flying over, and even sitting upon its surface. Within the thickets of tamarisk and oleander, which here and there may be seen upon its brink, the birds sing as sweetly as in more highly-favoured quarters. A curious plant grows on the borders of the D. S., the *Asclepias procera*, which yields fruit called the Apples of Sodom, beautiful on the outside, but bitter to the taste, and when mature, filled with fibre and dust.

The *water* of the D. S. is characterised by the presence of a large quantity of magnesian and soda salts. Its specific gravity ranges from 1172 to 1227 (pure water being 1000). The proportion of saline matter is so great, that whilst sea-water only contains 30 parts of salts in the 1000 parts, the water of the D. S. contains about 250, or eight times more than that of the ocean. The saltness of the D. S. has been explained in several ways; but there is no need to advert to more than one. It is a circumstance attending all lakes or collections of water without any outflow, that the water acquires an infusion of salt, its feeders constantly bringing in this material, while none can go off by evaporation. It may, moreover, be remarked that, if the D. S. was formerly at a higher level, and brought down to its present pitch by evaporation, a deposit of salt, such as we see on its banks, would be the natural consequence. Considerable deposits of common salt, sulphate of lime, and carbonate of lime have been formed along the bottom of the lake; and there is reason to believe that the deposits of rock-salt which occur in Cheshire, Poland, and other places, have been formed at remote periods by depositions in lakes similar to those of the Dead Sea.

**DEADLY NIGHTSHADE.** See Belladonna.

**DEAD'S PART.** The portion of the movable estate of the deceased which remains over, after satisfying the legal claims of his wife and children, should he have left such, is known in Scotland as the dead's part. It is so called, because it is with reference to this portion of his possessions alone that he possessed the power of disposal by will or testament. The D. P. may be increased by renunciations or discharges of their legal rights by the wife or the children, so as to include the whole movable estate, but these discharges must be express. The D. P. may also be increased or diminished by the conventional provisions of a marriage contract. See Marriage Contract, and Succession, Movable, in Scotland.

A distribution of the personal estate of the deceased, similar to that which is still followed in Scotland, prevailed, in accordance with the ancient customs, within the city of London and the province of York, and was probably common to the whole island (see Stephen's *Com.* ii. 222, and note). These customs have now been abolished by 19 and 20 Vict. c. 94. See Succession, Personal, in England.

**DEAF AND DUMB.** Persons who are born deaf, or who lose their hearing at a very early age, are dumb also; hence the compound term deaf-*and*-dumb. But the primary defect is deafness; dumbness is only the consequence of it. Children ordinarily hear sounds, and then learn to imitate them; that is, they learn to repeat what they hear other persons say. It is thus that every one of us has learned to speak. But the deaf child hears nothing; cannot therefore imitate, and remains dumb.

Persons who lose their hearing later in life are not to be classed among the deaf and dumb. Having learned to speak before their hearing was lost, they can readily communicate with others, though deaf themselves; and if they are educated, there are still open to them all the stores of knowledge contained in books, from which the juvenile deaf and dumb, ignorant of all written and spoken language, are utterly excluded. It is this latter class alone which we have to deal with in our statistics, which is contemplated in our census enumerations, and for which our institutions for the education of the deaf and dumb are specially designed.

The term 'deaf and dumb' is somewhat unfortunate, as embodying and repeating the error that the affliction is twofold. It affects two organs, certainly, but only, as above described, in the way of cause and effect. The organ of hearing is wanting, but the organs of speech are present; they merely lack the means of exercise. The ear is the guide and directress of the tongue; and when she is doomed to perpetual silence, the tongue is included in the ban; though, if we could by any means give to the ear the faculty of hearing, the tongue would soon learn for itself to fulfil its proper office. To correct the error involved in this apparent misnomer, some authorities use the terms *deaf-dumb* and *deaf-mute.* The latter seems to be a customary expression in America, as in France it is *Sourds-muets*. In the Holy Scriptures, the same original word is translated '*deaf*' in some places (as in St Mark vii. 32), and '*dumb*' or '*speechless*' in others. (See Matt. ix. 33, and Luke i. 22.)

This affliction is very much more common than, for a long time, and up to a recent period, it was supposed to be. Happily, however, along with the knowledge of its extensive prevalence, have come the means of alleviating it, by education. It was only when the schools now in existence began their useful work, and caused inquiries to be made, that the actual numbers of the deaf and dumb began to appear. In every place where it was proposed to establish a school—in Paris, London, Liverpool, Manchester, Yorkshire, and in New York—the objection was immediately started, that children could not be found in sufficient numbers to require such schools. Their promoters, however, knew better than this, and persisted in their design. They soon had the satisfaction of converting the objectors into their warmest supporters; and the institutions thus established, in the localities just named, are now the largest, the most useful, and the most prosperous in the world.

The facts thus ascertained, and the calculations based upon them, continued to be the only statistics upon the subject of deaf-dumbness in Great Britain and Ireland until the census of 1851: then, for the first time in this country, the number and ages of the deaf and dumb formed a part of the inquiry. In Ireland, a further investigation was subsequently made, which resulted in the collection of a mass of valuable information upon the causes of deafness, the social condition of the deaf-mute, and other kindred subjects, which has been published in a *Report on the Status of Disease* in that country. There the inquiry was conducted under a special commission; in Great Britain, it was directed by the registrar-general, and its first purpose was to ascertain the number and ages of the deaf and dumb of each sex. It would have been well if it had been limited to this, for the educational statistics were grossly incorrect and deceptive. Perhaps the mistakes which were made were the natural incidents of a first attempt. If, in the census just taken, these errors are avoided, we shall not only obtain a valuable stock of recent and more accurate information, but we shall, for the first time, possess means of comparison, of the greatest importance. The number of children under instruction in the various schools is considerably greater than it was ten years ago; new institutions have been built, and old ones enlarged to meet the additional claims upon them for admission. It is probable that at least 1600 pupils are now in the various schools of Great Britain and Ireland, though in 1851 there were but 1300. Many questions are suggested by this fact, which the census returns of 1861 may help us to solve. Is education more valued and sought after, or is the number of deaf-mutes absolutely increased? If the latter, is the increase in exact proportion to the increase of population, or not? Do the numbers of those born deaf, and of those who have become deaf from disease, preserve the same proportion to each other, and to the general population? These are all questions of the greatest importance, and the possession of accurate information will throw light upon many of the difficulties which surround this subject.

The latest available returns (those of 1851) exhibit the following particulars of the number of deaf and dumb persons in this country, and the proportion which they bear to the whole population:

| | Number of Deaf and Dumb. | Total Population. | Proportion. |
|---|---|---|---|
| England, . . . . | 9543 | 16,738,605 | 1 in 1754 |
| Ireland, . . . . | 4747 | 6,552,324 | 1 " 1380 |
| Scotland, . . . . | 2155 | 2,888,742 | 1 " 1340 |
| Wales, . . . . | 771 | 1,188,914 | 1 " 1542 |
| Islands in the British Seas, | 84 | 143,126 | 1 " 1704 |
| Total, . . | 17,300 | 27,511,801 | 1 in 1590 |

This result of 1 in 1590 for all the British population is very remarkable, on account of its close approximation to the average for the whole of Europe, which is stated in the same returns to be 1 in 1593. As to the local prevalence of deafness, it will be seen in the following table that the proportion varies greatly in different parts of the kingdom:

| | Number of Deaf and Dumb. | Total Population. | Proportion. |
|---|---|---|---|
| Northern counties of England, . . . | 471 | 969,126 | 1 in 2058 |
| North-western, *i.e.*, Lancashire and Cheshire, | 1237 | 2,490,827 | 1 „ 2014 |
| South-eastern counties, | 836 | 1,628,386 | 1 „ 1948 |
| South-midland ditto, | 649 | 1,234,332 | 1 „ 1902 |
| London, . . . . | 1325 | 2,362,236 | 1 „ 1783 |
| North-midland counties, | 694 | 1,214,538 | 1 „ 1750 |
| Yorkshire, . . | 1042 | 1,789,047 | 1 „ 1717 |
| Eastern counties, . . | 669 | 1,113,982 | 1 „ 1665 |
| West-midland ditto, . | 1325 | 2,132,930 | 1 „ 1610 |
| Wales (including Monmouthshire), . . | 771 | 1,188,914 | 1 „ 1542 |
| Connaught, Ireland, . | 674 | 1,010,031 | 1 „ 1499 |
| Southern counties of Scotland, . | 1225 | 1,813,562 | 1 „ 1480 |
| Leinster, Ireland, . . | 1135 | 1,672,753 | 1 „ 1474 |
| South-western, England, | 1295 | 1,803,291 | 1 „ 1393 |
| Ulster, Ireland, . . | 1527 | 2,011,890 | 1 „ 1318 |
| Munster, ditto, . . | 1411 | 1,857,650 | 1 „ 1317 |
| Northern counties of Scotland, . . | 930 | 1,075,180 | 1 „ 1156 |

A comparison between the first item in the foregoing table and the last, shews us that in the northern counties of Scotland there are nearly twice as many deaf-mutes as in the northern counties of England; and the diversity in some of the English counties is still more remarkable. Thus, for one deaf-mute in Lancashire, there are two in Herefordshire; for one in Huntingdonshire, there are three in Herefordshire; for one in the East Riding of Yorkshire, there are two in Worcestershire; for one in Durham, there are two in Derbyshire, and two in Cornwall.

How far this affliction is inevitable, and how far preventable by improved sanitary arrangements, by medical science and skill, by the prudence of individuals in avoiding marriage with blood-relations, or unions which are likely to result in the transmission of constitutional defect—these are all questions which cannot now be determined. When the facts which bear upon the subject have been fully ascertained, and the truth which they declare is placed beyond question, it is to be hoped that we shall see the number of this afflicted class brought down to the point at which it may be considered due to causes which are beyond man's control, subject alone to the will of the All-wise, who revealed himself in the earliest ages of the world as the maker of man's mouth, of the Dumb and the Deaf, the Seeing and the Blind (Exod. iv. 11). But while social science is prosecuting this important inquiry, Philanthropy has before her the work of educating these 'children of silence,' to whom the ordinary means of instruction are obviously inapplicable, and for whom, until a century ago, there existed no available means of education at all. Mentioned, as we have just seen, at the outset of man's history, by Moses; spoken of frequently in the writings both of the Old and New Testaments; alluded to by the poets, philosophers, and law-givers of antiquity—we have no account of any attempt at educating the deaf until the 15th c.; no school existed for them until the middle of the 18th; nor could it be said that education was freely offered, and readily accessible, until within the last thirty years. There are now in Europe and America about 200 schools for the deaf and dumb. In the same countries where this provision is made, there were, according to the latest returns upon the subject, between 90,000 and 100,000 deaf-mutes. Of these, about 16 per cent. are of the proper age to be at school, but nowhere is this proportion reached. The nearest approximation to it is in Scotland and in the United States. In only a few countries are the returns sufficiently recent and accurate to be depended upon, and the state of education in them is shewn by the following: In the United States, there were 1162 at school, out of 9717 = 12 per cent.; in Scotland, 250 at school, out of 2155 = more than 11½ per cent.; in England and Wales, 816 at school, out of 9543 = 8 per cent.; in France, 1642 at school, out of 29,512 = 5½ per cent.; in Ireland, 234 at school, out of 4747 = 5 per cent. Thus, of those who were of the proper school-age, there were actually under instruction only 34½ per cent. in Ireland, 50 per cent. in England, and 70 per cent. in Scotland. The next returns may be expected to shew a large increase upon these numbers; and if it should be thought that this is but a meagre result, it must be remembered that only within the present century has this work of educating the deaf and dumb taken a systematic and practical shape at all. Yet during this period—that is to say, since 1792, when the London Asylum, the first public institution in this country, was established—between 7000 and 8000 deaf-mutes have been educated in the schools of Great Britain and Ireland, and upwards of 5000 in those of the United States since 1817. Add to these the pupils of the various continental institutions since 1760, when De l'Epée collected his little group of children in the environs of Paris, and Thomas Braidwood opened his school in Edinburgh, and we should then see that the fruits of these men's labours have not been meagre, but great and marvellous. Some isolated attempts had previously been made, by different men, in different countries, and at long intervals, to give instruction to one or two deaf and dumb persons, and their endeavours had been attended with various degrees of success. These several cases excited some attention at the time; but after the wonder at their novelty had subsided, they seem to have been almost forgotten, even in the countries where the experiments were made. Bede speaks of a dumb youth being taught by one of the early English bishops, known in history as St John of Beverley, to repeat after him letters and syllables, and then some words and sentences. The fact was regarded as a miracle, and was classed with others alleged to have been wrought by the same hand. From this time, eight centuries elapsed before any record of an instructed deaf-mute occurs. Rodolphus Agricola, a native of Gröningen, born in 1442, mentions as within his knowledge the fact that a deaf-mute had been taught to write, and to note down his thoughts. Fifty years afterwards, this statement was controverted, and the alleged fact pronounced to be impossible, on the ground that no instruction could be conveyed to the mind of any one who could not hear words addressed to the ear. But the discovery which was to give the key to this long concealed mystery was now at hand. In 1501, was born, at Pavia, Jerome Cardan (q. v.), a man of great but ill-regulated talents, who, among the numerous speculations to which his restless mind prompted him, certainly discovered the theoretical principle upon which the instruction of the deaf and dumb is founded. He says: 'Writing is associated with speech, and speech with thought; but written characters and ideas may be connected together *without* the intervention of sounds,' and he argues that, on this principle, 'the instruction of the deaf and dumb is difficult, but it *is possible.*' All this, which to us is obvious and familiar, was a novel speculation in the 16th century. With us, it is a common thing for a man to teach himself to *read* a language though he cannot pronounce it. There are, for instance, hundreds of persons who can read French, who do not and cannot speak it. Now, it is evident, in this case, that written or printed words do impart ideas independently of sounds, yet this was a discovery which the world owes to Jerome Cardan; and it was for want of seeing this truth, which to us is so familiar, that the education of the deaf and dumb was never attempted, but was considered for so many centuries to be a thing impossible. It was in Spain that these principles were first put into practice by Pedro Ponce, a Benedictine monk, born at Valladolid in 1520, and again, a century afterwards, by another monk of the same order, Juan Paulo Bonet, who also published a work upon the subject, which was the first step towards making the education of the deaf and dumb permanent, by recording the experience of one teacher for the instruction of others. This book, published in 1620, was of service to De l'Epée 150 years later; and it contains, besides much valuable information, a manual alphabet identical in the main with that one-handed alphabet which is now in common use in the schools on the continent and in America. From this time there was a general awakening of the attention of intellectual men, not only to the importance of the subject, but to the practicability of instructing the deaf-mute. One of Bonet's pupils was seen by Charles I., when Prince of Wales; and the case is described by Sir Kenelm Digby, who was in attendance upon the prince, on his memorable matrimonial journey into Spain. When the art died away in that country, it was taken up by Englishmen, and began forthwith to assume an entirely new aspect. Dr John Bulwer published, in 1648, his *Philocophus, or the Deafe and Dumbe Man's Friend;* Dr William Holder published his *Elements of Speech, with an Appendix concerning Persons Deaf and Dumb*, in 1669; and Dr John Wallis, Savilian Professor of Mathematics in the university of Oxford, both taught the deaf and dumb with great success, and wrote copiously upon the subject. In 1662, one of the most proficient of his pupils was exhibited before the Royal Society, and in the presence of the king. The *Philosophical Transactions* of 1670 contain a description of his mode of instruction, which was destined to bear ample fruits long after his death.

Before the close of the 17th c., many works of considerable merit appeared, the chief of which are the *Surdus Loquens* (the Speaking Deaf Man) of John Conrad Amman, a physician of Haarlem; and the *Didascolocophus*, or deaf and dumb Man's Tutor, of George Dalgarno. This treatise, published in 1680, and reprinted a few years ago by the Maitland Club, is eminently sound and practical, which is the more remarkable, as the author speaks of it as being, for aught he knows, the first that had been written on the subject. He is the first English writer who gives a manual alphabet. The one described by him, and of which he was the inventor, is, most probably, the one from which our present two-handed alphabet is derived. Dalgarno was by birth a Scotchman, but was long resident at Oxford. He died in 1687, and Dr Wallis in 1703. From that time until 1760, nothing more was done in this country—though the subject was beginning to excite some attention in France—to resume the work which had been thus far prosecuted and helped on by the writings and labours of these eminent men. In 1760, when the Abbé De l'Epée was opening his little school in Paris, the first school in the British dominions was also established in Edinburgh, by Thomas Braidwood. He commenced with one pupil, the son of a merchant in Leith, who had strongly urged him to carry into effect the plan of instruction followed by Dr Wallis, and described in the *Philosophical Transactions* ninety years before. This school, the parent and model of the earlier British institutions, was visited and spoken of by many of the influential men of that day, and its history and associations are imperishable. Its local name of *Dumbiedikes* suggested to Sir Walter Scott a designation for one of his most popular characters in the *Heart of Mid-Lothian.* A visit paid to it in 1773, by Dr Johnson, and his biographer Boswell, supplies one of the most suggestive and characteristic passages in the *Journey to the Western Islands.* In the year 1783, Mr Braidwood removed to Hackney, near London, and the presence of his establishment so near to the metropolis undoubtedly led to the foundation of the London Asylum in 1792. Dr Watson, its first principal, was a nephew, and had been an assistant, of Mr Braidwood; and he states that, some ten or fifteen years previously, the necessity for the establishment of a public institution had been plainly seen, and some few but insufficient steps taken towards the accomplishment of such a design. From its foundation in 1792 until 1829, it was directed with great ability by Dr Joseph Watson, in whose work on the *Instruction of the Deaf and Dumb*, this statement is given. On his decease, he was succeeded by his son, Mr Thomas James Watson, of Clare Hall, Cambridge, who had assisted his father in the later years of his life, and had also officiated for a short time as the principal of the Glasgow institution. The death of Mr Watson took place at the end of 1857, and the educational management of this important establishment was committed to his eldest son, the Rev. James H. Watson, M.A., of Pembroke College, Cambridge. This, the oldest public institution in Great Britain, and the largest in the world, has existed nearly seventy years: it contains upwards of 300 inmates; it has educated not less than 3000 persons; it has trained a numerous staff of assistants, from whom have been selected, at various times, the principals of some of the most important institutions in the kingdom; it has received, and sent back to their homes, pupils from every part of England; from Wales, Scotland, Ireland, and the Channel Islands; and from numerous dependencies of the British crown, beginning with Gibraltar and Malta, and extending to India and Australia. This large field of usefulness is now to some extent occupied by the younger institutions, which have subsequently sprung up in the more populous parts of the kingdom, to meet local necessities, and to make easily accessible to the deaf and dumb the inestimable blessings of education.

The following table shews, in the most concise manner, the position and date of the various institutions in Great Britain and Ireland, and the number of inmates, as nearly as they can be ascertained:

| Locality. | Date. | Principal. | Inmates. |
|---|---|---|---|
| *England and Wales:* | | | |
| London, . . | 1792 | Rev. J. H. Watson, M.A. | 315 |
| Birmingham, . | 1812 | Mr A. Hopper, B.A. | 90 |
| Manchester, . . | 1823 | Mr A. Patterson. | 134 |
| Liverpool, . . | 1825 | Mr D. Buxton, F.R.S.L. | 95 |
| Exeter, . . . | 1827 | Dr W. B. Scott. | 42 |
| Doncaster, . | 1829 | Mr Charles Baker. | 100 |
| Newcastle, . . | 1839 | Mr William Neill. | 60 |
| Brighton, . . | 1841 | Mr W. Sleight. | 78 |
| Bristol, . . . | 1841 | Mr John Clyne. | 22 |
| Bath, . . . | 1842 | Rev. F. Elwin. | 44 |
| Swansea, . . | 1847 | Mr A. Melville. | 17 |
| *Scotland:* | | | |
| Edinburgh, . . | 1810 | Mr W. Hutchinson. | 41 |
| 〃 Donaldson's Hospital, | 1850 | Mr A. M'Diarmid. | 70 |
| Glasgow, . . | 1819 | Mr D. Anderson. | 76 |
| Aberdeen, . . | 1819 | Mr R. Scott. | 30 |
| Dundee, . . | 1846 | Mr A. Drysdale. | 40 |
| *Ireland:* | | | |
| Dublin, Claremont, | 1816 | Mr E. J. Chidley. | 57 |
| 〃 Roman Catholic Institution, | 1846 | Religious Orders. | 167 |
| Belfast, . . . | 1831 | Rev. J. Kinghan. | 91 |
| Strabane, . . | 1846 | Mr G. W. Downing. | 15 |

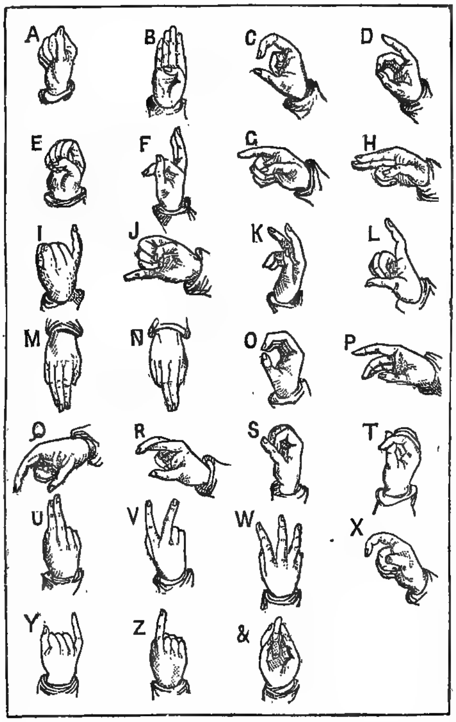
Thus, it is to the present century that the honourable distinction belongs of having done so much for the deaf and dumb; and this has not been by inventing the art of teaching, or by raising up the earliest labourers in this field of usefulness, but by founding and supporting public institutions for this purpose. De l'Epée, when he opened his school in 1760, had no foreknowledge of the work he was commencing. As his labours increased, he invited others to his assistance, and they were thus enabled to carry the light of instruction elsewhere, and to keep it alive when he was no more. His death took place in 1789, and his assistant, Sicard, succeeded him. Four years afterwards, this school was adopted by the French government, and now exists as the Imperial Institution of Paris. A pupil of the same Institution, M. Laurent Clerc, on being applied to in 1816, consented to go to the United States with the founder and first principal of the American asylum, and he became, like De l'Epée, *le Père des Sourds-muets* (the Father of the deaf and dumb) in the New World. From these small beginnings of Braidwood and De l'Epée, of Heinicke in Germany, and Gallaudet in America, have arisen, within a century, 200 schools for the deaf and dumb. In Great Britain and Ireland there are 20 institutions, 16 in the United States, 2 in British America, about 70 in Austria, Prussia, and the smaller kingdoms and states of Germany, 50 in France, 10 in Italy and in Switzerland, the same number in Holland and Belgium, 5 in the Danish dominions, 3 in Russia and Poland, 2 in Spain, 1 in Portugal; and the effort is being made in one if not more of the great centres of population in Australia, to provide education for the deaf-mute at the antipodes.

The mental condition of the deaf and dumb is so peculiar—so entirely unlike that of any other branch of the human family—that it is extremely difficult, without very close thought, to obtain an accurate conception of it. While almost every one will readily admit that there is a wide difference between a deaf and a hearing child, very few, who have not had their attention painfully drawn to the subject, possess any adequate notion of the difference, or could tell wherein it consists. Sometimes the deaf are compared with the blind, though there exists no proper ground of comparison between them. Except that the blind are more *dependent* than the deaf and dumb, the relative disadvantages of the two classes do not admit of a moment's comparison. The blind man can be talked with and read to, and is thus placed in direct intercourse with the world around him: domestic converse, literary pleasures, political excitement, intellectual research, are all within his reach. The person born deaf is utterly excluded from every one of them. The two afflictions are so essentially dissimilar, that they can only be considered and spoken of together by way of contrast. Each of them affects both the physical and the mental constitution; but blindness, which is a grievous bodily affliction, falls but lightly on the mind; while the effect of deafness is the extreme reverse of this—it touches only one bodily organ, and that not visibly, but the calamity which befalls the mind is one of the most desperate in 'the catalogue of human woes.' The deprivation under which the born-deaf labour is not merely, or so much, the exclusion of sound, as it is the complete exclusion of all that information and instruction which are conveyed to our minds, and all the ideas which are suggested to them, by means of sound. The deaf know almost nothing, because they hear nothing. We, who do hear, acquire knowledge through the medium of language—through the sounds we hear, and the words we read—every hour. But as regards the deaf and dumb, speech tells them nothing, because they cannot hear; and books teach them nothing, because they cannot read; so that their original condition is far worse than that of persons who 'can neither read nor write' (one of our most common expressions for extreme ignorance); it is that of persons who can neither read, nor write, nor hear, nor speak; who cannot ask you for information when they want it, and could not understand you, if you wished to give it to them. *Your* difficulty is to understand *their* difficulty; and the difficulty which first meets the teacher is, how to simplify and dilute his instructions down to their capacity for receiving them.

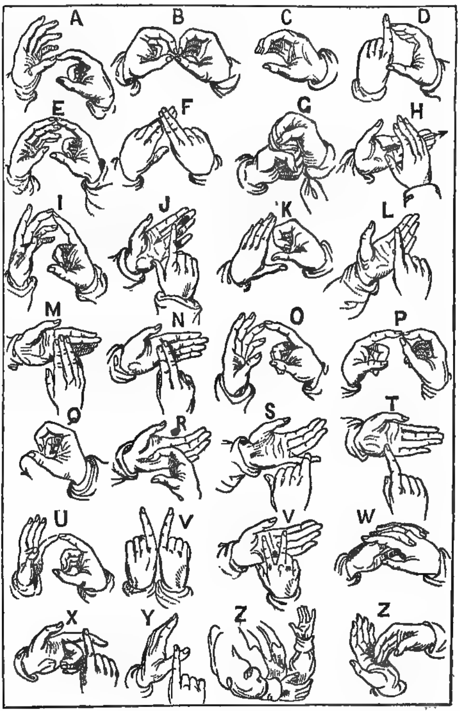
A class thus cut off from all communication through the ear, can only be addressed through the eye; and the means employed in the instruction of the deaf and dumb are—1. The *visible* language of pictures, and of signs and gestures; 2. The finger-alphabet (or Dactylology), and writing, which make them acquainted with our own *written* language; and, in some cases, 3. Articulation, and reading on the lips, which introduce them to the use of *spoken* language. The education of the deaf and dumb must be twofold—you must awaken and inform their minds by giving them ideas and knowledge, and you must cultivate them by means of language. The use of signs will give them a knowledge of things; but to this must be added a knowledge of words. They are therefore taught, from the first, that words convey the same ideas to our minds which pictures and signs do to theirs; they are therefore required to change signs for words until the written or printed character is as readily understood as the picture or the sign. This, of course, is a long process, as it has to be repeated with every word. Names of visible objects (nouns), of visible qualities (adjectives), and of visible actions (verbs), are gradually taught, and are readily acquired; but the syntax of language, abstract and metaphorical terms, a copious diction, idiomatic phraseology, the nice distinctions between words called synonymous, and those which are identical in form, but of different signification—these are far more difficult of attainment; they can only be mastered through indomitable perseverance and application on the part of the pupil, in addition to the utmost skill and ingenuity of the teacher. The wonder, therefore, surely is, seeing the point of starting, that this degree of advancement is ever reached at all.

Yet it has been set forth by otherwise respectable authority, that the deaf and dumb are a '*gifted* race;' that they are remarkable for 'their promptitude in defining abstract terms;' and those who ought to have known better, and who *did* know better, have strengthened this delusion, if, indeed, they did not cause it, by such proceedings as the publication of 'Essays' purporting to be 'by the Deaf and Dumb,' in which the pupils wrote better English than their master: and by putting forth, as the *bonâ-fide* answers of deaf-mutes, those brilliant aphorisms and definitions of Massieu and Clerc, which are so often quoted at public meetings, by eloquent speakers who know nothing of the subject. It is very well known to those who *are* acquainted with the subject, that the so-called definitions, of *Hope*, *Gratitude*, *Time*, *Eternity*, &c., were not Massieu's at all, but those of his master, the Abbé Sicard. The influence of these fallacies has been most mischievous; they raise expectation to an unreasonable height, for it is thought that what was done by 'the celebrated pupil of the Abbé Sicard,' may be done every day: and disappointment is the inevitable consequence. The honest, laborious teacher who cannot produce these marvellous results, and will not stoop to deception, has often to labour on without that appreciation and encouragement which are so eminently his due; the cause of deaf-mute instruction suffers, and a young institution is sometimes crippled by the failure of support, which was first given from one impulse, and is now withdrawn from another—not a whit more unreasonable than the first, but very unfortunate in its consequences.

The course of instruction is very much the same in all the schools of this country. In the London Asylum, and in Donaldson's Hospital, Edinburgh, articulation is professedly and systematically taught to every pupil. In other British institutions, it is taught in certain cases only. Very decided and opposite views are held upon the subject, but the question is practically determined in most cases by the financial difficulty. It would require more time and a larger staff of assistants to teach articulation, in addition to the other subjects of instruction, than the moderate means of the institutions generally could afford. The Metropolitan Asylum, and the noble foundation of James Donaldson, near Edinburgh, enjoy ample funds; and these, it is to be hoped, will always be applied so as to give to the deaf and dumb every educational advantage which they are capable of receiving.



One-handed Alphabet.



Two-handed Alphabet.

The manual alphabet in common use in the schools of this country is the two-handed one, though the other is used in some of the Irish institutions, and is regarded with favour by a few of the English teachers. The arguments in its favour, like those for the decimal currency, may probably be admitted: it would be better if we had it. But the rival system has got possession, and is in familiar use, and persons are apt to think that the inconveniences of making the change would outweigh the advantages to be expected from it. The institutions in Great Britain are supported by annual subscriptions, donations, and legacies, and by the payments of pupils for their board. The larger benefactions are invested, where the annual income from ordinary sources will admit of it. Committees, chosen from the body of subscribers, direct the affairs of these institutions, the executive officers being the head-master and the secretary; but in some cases the sole charge is intrusted to the principal. The gentlemen who fill this office have devoted their whole lives to the work; some of them have also done good service by their writings upon the subject. Mr Baker of Doncaster, Dr Scott of Exeter, and Mr Buxton of Liverpool, have all helped to make it better known and better understood than it could possibly be when it was treated by men with no practical knowledge, as a merely literary topic, or a subject of philosophical curiosity. Justice also requires the mention here of the valuable writings of Dr Peet of New York, and other American instructors of the deaf and dumb. The institutions in the Western World are munificently supported by grants from the states, and appear to be admirably managed. The staff of teachers is numerous, able, and efficient, and a high degree of success may fairly be expected where the work is carried on under advantages which are unknown in the schools of Great Britain. New York contains also a church for deaf-mutes, of which the Rev. Thomas Gallaudet, son of the founder of the American Asylum, is the minister, and where at least one service every Sunday is conducted in the language of signs. At a meeting held under the presidency of Bishop Potter, to promote the erection of a new church, Mr Gallaudet stated some interesting facts concerning his little flock. 'From October 1852 to May 1858, there had been baptised 11 adults, of whom 10 were deaf-mutes; and 33 children, 14 of whom had deaf-mute parents. Thirty-six persons had been confirmed, of whom 26 were deaf-mutes; 21 couples married, 10 of which were deaf-mutes; 30 burials had taken place, 8 for deaf-mute persons, and 2 for children of deaf-mute parents; and he had received 83 communicants, 43 of whom were deaf-mutes.' The same necessity which here is so admirably met, must exist in all large communities. In London and Manchester, special arrangements have been made to minister to the adult deaf and dumb; and in some of the other large towns of the kingdom, Sunday-services are held for the former pupils resident in those localities. The desirableness of some agency to supplement and continue the work begun in the institutions, in order to improve the condition of adults, has latterly been in consideration.

A novel experiment is now in operation at Manchester, where a school for the *infant* deaf and dumb has been established. It owes its origin to the persevering advocacy of Thomas Turner, Esq., an eminent surgeon of that city. It was opened on the 26th September 1860, when 26 candidates, of ages varying from six years and eleven months to three years and five months, were admitted. In the Liverpool school, the age of admission is seven years, and this has been found to work well; but the minimum age of admission into most of the other institutions is from eight to nine years. Now, as soon as a child is able to learn anything, he ought to learn something; and deaf children can with difficulty be kept out of mischief and danger, even when under watchful oversight; but in the manufacturing districts, where female labour is valuable, the mothers of families are frequently absent from their homes, at work in the factories, every day of the week. It is this circumstance which makes Manchester the best field for an experiment of this kind. The local necessity is peculiar, and the spirit and energy which have been enlisted in this work will go far to insure its success.

These are the means at present employed for the benefit of the deaf and dumb, and it is no small honour to the present century, which has won so many proud distinctions in other fields of enterprise and usefulness, that it should have done so much for those who for so many generations were utterly excluded from light and knowledge.

**DEAF AND DUMB** (in Law). From the imperfect methods formerly in use for the education of the deaf and dumb, they were almost everywhere held to be legally in the same position as idiots and madmen. The Roman law held them to be incapable of consent, and consequently unable to enter into a legal obligation or contract. Both in England and Scotland, the amount of their capacity is now a question of fact, which, in cases of doubt, will be referred to a jury. In the same manner, a mute will be examined as a witness in regard to a fact to which he is capable of bearing testimony, and the examination will be conducted in the manner which seems most likely to elicit the truth. (Best, *Law of Evidence*, p. 201.) The same principle will govern the estimate of his responsibility for crime. (Stephen's *Com.* iv. 461.) It is of course legally, as it is physically, impossible that a mute should act as a juror.

**DEAFNESS** may be complete or partial, may affect both ears or only one, may date from birth, be permanent or only temporary, and is but too often one of the distressing symptoms of advancing age. The causes of deafness are numerous. On glancing at the article AUDITORY NERVE, the reader will at once remark the extraordinary intricacy of the hearing-apparatus there described, and will easily conceive that although it be contained in a little nut of densest bone (the petrous portion of the temporal), still it is exposed to many deteriorating influences, and that very slight causes may disarrange the exquisite adjustment of its parts. 1. The auditory nerve may itself be unsusceptible to the stimulus of sound, from some diseased condition at its origin in the brain, or at its final subdivision in the labyrinth. This is termed nervous deafness. 2. The structures which conduct the vibrations of sound to the labyrinth may be faulty, from accident or disease. 3. The passage leading to the tympanum or drum may be blocked up. 4. The cavity of the drum may have ceased to be resonant, owing to deposits from inflammatory attacks, to loss of its membrane, or air being excluded, from obstructions in the passage between it and the gullet (the Eustachian tube).

Nervous deafness may be caused by a sudden concussion, as from a 'box on the ear,' or a general shock to the whole body, as in the case of the celebrated Dr Kitto, who lost his hearing, when a boy, by a fall from the top of a house. The concussion from loud sounds suddenly taking the ear unawares, before its small muscles have time to prepare themselves for the shock, causes the deafness which follows the firing of cannon. Even a loud yell close to the ear has been sufficient to destroy the hearing-power on that side. As such an accident is generally accompanied by an increased flow of blood to the part injured, it may be relieved by the application of leeches, applied behind the auricle, and the ear should for some time be protected from loud sounds as carefully as possible. In some of these cases the nerve gradually recovers its sensibility, but in many the deafness continues, and is accompanied by a distressing singing in the ears. Exposure to cold affects the auditory nerve; and gouty persons, or those who are suffering from the poisons of typhus fever, scarlatina, measles, mumps, &c., frequently become deaf. Some medicines, as quinine, produce nervous deafness; so do debility and mental excitement; but all these causes seem to act in one way—viz., to increase the flow of blood to the ear, and should be treated accordingly.

The solid conductors of sound to the auditory nerve may be injured or diseased, so that the vibrations are interrupted. One curious cause of deafness has been recently shewn to exist by Mr Joseph Toynbee of London—viz., an increasing stiffness in the little joint by which the stirrup-bone moves in the oval window of the vestibule; this stiffness prevents the base of the stirrup pressing inwards sufficiently to affect the contents of the labyrinth, therefore it ceases to keep the auditory nerve *en rapport* with the membrane of the drum. This condition may be recognised during life by the patient losing the power of adapting his hearing to varying sounds. Two persons speaking at once prevents his hearing the voice of either; there is a constant buzzing in the ear, and he gets deafer and deafer day by day. This curious disease is frequently associated with gout and rheumatism, and in its earlier stages may be influenced by the same remedies as these; but if once established, it is incurable.

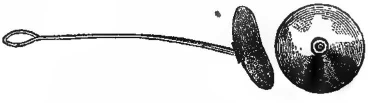
Sound reaches the auditory nerve through the vibrations of the bones of the head, but chiefly through the external opening in the auricle, the passage leading from which is shut at the depth of an inch and a quarter from the surface by the membrane of the drum stretching across it. Should this passage be blocked up, so that the sounds can no longer pass along it to impinge upon the membrane, either total or partial deafness must result.

The most common obstruction is an accumulation of the wax secreted by a small ring of glands near the orifice. The object of this cerumen or wax is to catch the particles of dust floating in the atmosphere; but sometimes it is harder than usual, and is no longer gradually expelled by the movements of the jaw in speaking and eating. At last, it fills the passage in the form of a hard plug, and sounds can neither pass through it nor by its side; if left, it gradually causes serious changes in the shape of the passage, and even symptoms resembling diseases of the brain. Sometimes foreign bodies find their way into this passage, or tumours grow in it, and no unprofessional attempts should be made to remove them, lest the membrane of the drum be injured. It is but seldom that any instruments are necessary in addition to a stream of water thrown briskly in by means of a syringe, with a nozzle smaller than the circumference of the passage. Should the wax be very firm and hard, it is well to soften it by dropping in some oil or an alkaline solution. But even a stream of water, unless great care be taken, may injure or burst the delicate membrana tympani, and the proceeding leave the patient suffering from a more serious condition than before.

A membrane, to be resonant, must have air on both sides of it, and the membrana tympani obtains this essential by means of the Eustachian tube, the lower orifice of which, on each side of the gullet, opens for a brief period at each act of swallowing, and admits a small quantity of air, which ascends into the tympanic cavity, if the tube is in a healthy condition; but frequently in persons suffering from relaxed mucous membrane, the Eustachian passage becomes swollen and impassable, or blocked up by some thickened mucous secretion. During a common cold, persons often suffer from this cause of deafness. It has been supposed by some, that enlarged tonsils may interfere with the pharyngeal opening of the tube, and with that view they cut portions off them occasionally with great benefit to the condition of throat in which these glands are enlarged; but the latter are situated below and in front of the Eustachian tubes, and cannot be the immediate causes of the obstruction.

In some cases, the membrane of the drum may be perforated; and though the mere perforation is not sufficient to cause more than a slight degree of deafness, if the mucous membrane lining the tympanic cavity be thickened at the same time, the person is usually able to hear only the loudest sounds. If the perforation be stopped up, however, the air confined in the tympanic cavity vibrates sufficiently to stimulate the auditory nerve, through the round window of the labyrinth, and a useful degree of hearing is restored. In 1848, Mr Yearsley of London shewed that a small pellet of cotton-wool might be used for this purpose. It should be moistened with fine oil, and inserted on the end of a probe. Patients generally learn how to stick it neatly into the aperture themselves. It should be removed every three or four days, or oftener, should cleanliness require it.

Mr Toynbee has invented an artificial membrana tympani of vulcanised india-rubber, attached to the end of a fine silver wire, by which it can be inserted or withdrawn. These beautiful little instruments may now be obtained of every surgical instrument-maker, and are at least worth trying in cases of perforated membrana tympani, as they often do good, can do no harm, and are very cheap. The india-rubber having been pared to the size likely to fit the individual's ear, it is moistened with warm water, and gently passed down the auditory passage; the sensations of the patient will easily decide when it has gone far enough, and he gladly discovers, by the sound of his own voice or that of the surgeon, that his hearing has been suddenly improved.


Artificial Membrana Tympani.

The deafness of aged persons has been shewn, by Mr Toynbee, to be generally caused by the effects of previous inflammatory attacks, and may frequently be much relieved by counter-irritation behind the ear, alterative medicines, and washes which restore the healthy condition of the throat and the external auditory passage.

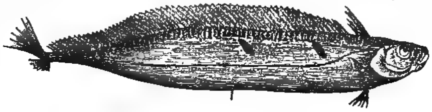
There are numerous 'cures for deafness' advertised from time to time; some are harmless if useless, others are useless, but very dangerous, owing to the readiness with which inflammation may be set up, and the liability of the latter to extend to the brain or its membranes. The diseases which affect the ear are the same as affect other organs, and require to be treated upon the same principles. It is always advisable, as soon as the first symptoms of approaching deafness are felt, to apply to one of the regularly qualified practitioners who devote themselves entirely to the subject, and to have nothing to do with these so-called *cures*, which benefit only the parties who sell them.

The best English works on the subject are *Practical Observations on Aural Surgery*, by William R. Wilde of Dublin, and *The Diseases of the Ear*, by Joseph Toynbee of London.

**DEAL**, a municipal borough, and member of the parliamentary borough of Sandwich, maritime town and sea-bathing place, in the east of Kent, on a bold open beach, near the south extremity of the Downs, between North and South Foreland, 18 miles east-south-east of Canterbury, and 8 miles north-north-east of Dover. It has three streets running parallel to the beach, and others stretching into the country. A fine anchorage extends 7 or 8 miles between D. and the Goodwin Sands. D. has mainly arisen to supply the wants of vessels which are often detained by the winds in the Downs to the number of 400 or 500 at a time. The chief branches of industry are connected with maritime pursuits, boat-building, sail-making, piloting or hovelling, victualling and naval stores. Pop. (1861) 7531. D. returns two members to parliament with Sandwich and Walmer. It has been one of the Cinque Ports since the 13th century. The coast near D. is defended by Deal Castle, near the town; Sandown Castle and three batteries on the north; and by Walmer Castle, a mile to the south. Walmer Castle is the official residence of the Warden of the Cinque Ports, and here the Duke of Wellington died in 1852. Henry VIII. built Deal Castle in 1539. Julius Cæsar, with two legions, in 82 ships, landed near D. in August 55 B.C. In 1859, 220 vessels, of 17,004 tons, entered and cleared the port.

The DEAL BOATMEN, who are an enterprising and courageous body of men, amount to between 200 and 300, and have become noted for giving assistance to ships in distress, and for saving the lives of crews and passengers. Besides performing these services, they have been useful in carrying off provisions to outward-bound vessels, and in bringing ashore mail-bags requiring to be forwarded by express. Latterly, in consequence of steam-tugs being much employed in expediting outward and inward bound vessels, and also from the mails from many foreign countries being landed at Falmouth and other places, to be forwarded to London by railways, the occupation of the Deal boatmen is nearly gone, and the community has sunk into poverty. Their case being made known by the press, some benevolent exertions were made to succour them. The community may be expected to diminish in proportion to the actual wants of navigation on the coast.

**DEALFISH** (*Trachypterus*), a genus of fishes of the ribbon-fish family, having the body much compressed, and so named D. from the resemblance of the form, to a piece of deal—a resemblance which is increased by the dorsal fin extending along the whole length of the back. The tail-fin exhibits a remarkable peculiarity, rising almost vertically from the horizontal line of the vertebral column, as if it had met with some accident, and assumed a new position. One species (*T. Bogmarus*), the VAAGMAER of the Icelanders and Norwegians, sometimes occurs on the most northerly British coasts. It is not common even on those of Iceland, and is apparently a deep-sea fish. It is a large fish, 4 or 5 feet in length, of a silvery colour, with minute scales. Other species are found in the Mediterranean.



Dealfish, or Vaagmaer.

**DEAL ISLAND**, an island in Bass's Strait, between Australia and Tasmania, is worthy of notice chiefly as having a light-house at an elevation of 880 feet above the sea.

**DEALS**, the trade-name for fir-boards exceeding 6 feet in length and 7 inches in width. Boards of smaller dimensions are called 'battens.' Deals are usually 3 inches thick, and when sawed into thinner pieces, these are called 'planks.' When a deal is sawed into twelve or more thin planks, they are called 'leaves.' Most of the deals imported into this country are from the Baltic ports, North America, Sweden, and Norway. Drammen is the principal Norwegian timber-port, though the general name for the deals from Norway is 'Christiania deals,' so named from the Norwegian capital, where the principal timber-merchants reside, and through which the business of the trade is chiefly transacted.

The duty upon deals and battens from foreign countries is 10*s.* per load of 50 cubic feet, or 5*s.* 3*d.* per load upon those imported from the British colonies. For the various qualities of deals, and their applications, see TIMBER.

**DEAN.** The institution of deaneries, as of other ecclesiastical offices of dignity, bears a resemblance to the methods of ancient civil government. Thus, for the preservation of civil order, every hundred consisted of ten districts, called tithings, and in every tithing was a constable or civil dean. In conformity to this, the spiritual governors, the bishops, divided each diocese into deaneries or decennaries (Lat. *decem*, ten), corresponding to tithings, each of which was the district of ten parishes or churches, over every one of which a D. was appointed, who in the cities or large towns was called the D. of the city or town, and in the country, *rural dean.* It has been supposed, but on no certain authority, that the D. of a chapter was appointed to superintend ten canons; but it is more probable that the name was given to the office from its analogy to those above described. In the English Church, there are the following dignitaries who bear this name:

1. In the province of Canterbury, it is part of the dignity of the archbishop to have prelates to be his officers, and of these the Bishop of London is his provincial D.; and when a convocation is assembled, the archbishop sends to him his mandate for summoning the bishops of the province. This is the sole example of the kind.

2. *Honorary Deans*, as the D. of the Chapel Royal of St James's.

3. *Deans of Peculiars*, as of Battle in Sussex, founded by William the Conqueror in memory of his conquest. There are also the Deans of the Arches in London, of Bocking in Essex, and of Croydon in Surrey, who have jurisdiction, but no cure of souls.

4. *Deans of Chapters*, as at Canterbury, St Paul's, &c., who are governors over the canons in cathedrals and collegiate churches. Their appointment is in the direct patronage of the crown, which may appoint by letters patent; and the D. so appointed is entitled to be installed. The D. of a chapter must reside eight months in the year, and he may hold one benefice with his deanery. The income of the office is, in the case of Durham, £3000; of St Paul's, Westminster, York, and Manchester, £2000; of other cathedrals, £1000, except St Davids and Llandaff, which have £700. See CATHEDRAL.

5. *Rural Deans.* These are very ancient officers of the church, but custom gradually transferred their duties to the archdeacon, as in the visitation of churches, parsonage-houses, &c. They may, however, act as deputies to the bishop and archdeacon; and of late the office has been revived with great advantage; and in well-ordered dioceses affords a useful channel of communication between the bishop and his clergy, and a means of joint action in matters affecting the church. There are altogether nearly 600 rural deaneries in England and Wales.

In the universities of Oxford and Cambridge, the D. is the officer who superintends the discipline of the college and the chapel services. At Christ Church, which is a cathedral, the D. is master of the college.

**DEAN OF THE CHAPEL ROYAL** (Scotland), an office held by three clergymen of the Established Church, to which they are appointed by the crown. The duties are nominal, being limited to an occasional sermon before her Majesty when in Scotland, and attendance at the election of the representative peers. Recent appointments, however, have been conferred in connection with chairs in the university of Edinburgh which are not otherwise endowed. The title of dean is somewhat out of place in the Church of Scotland, where the rule of Presbyterian parity is established. It is a remnant of Episcopacy, which the church courts have never had occasion to challenge, as the deans do not sit or act in that capacity, and have scarcely any ecclesiastical duties to perform. The benefice of the Chapel Royal, which was instituted by James V., was richly endowed, but it has been disputed whether the revenues now enjoyed by the deans belonged originally to the Chapel Royal of Stirling or to the Chapel Royal of Holyrood. It is known that the existing revenues were once attached to the see of Dunblane; and an act of parliament was passed in 1621, sanctioning the annexation of the revenues of the Chapel Royal of *Stirling* to the bishopric of Dunblane, which was the poorest bishopric in Scotland. Hence it is assumed that the whole existing deanery revenues belonged to the Chapel Royal of Stirling. But there are some facts which prove that the benefice was connected with the chapel at Holyrood equally with that at Stirling. William Couper, Bishop of Galloway, held the office of Dean of the Chapel Royal from 1615 to the commencement of 1619. He resided at the foot of the Canongate, and preached regularly in the Royal Chapel of

Holyrood. This individual drew part of his revenue from the parishes of Kirkinner and Kirkcowan in the county of Wigton, and part of the present deanery revenues is likewise drawn from the same parishes. Dr Adam Bellenden, who was Bishop of Dunblane when the act above mentioned was passed annexing the revenues of the Chapel Royal of Stirling to his bishopric, performed the duties of Dean of the Chapel Royal at Holyrood for many years subsequent to 1621. It seems clear, therefore, that if the revenues of the benefice were ever divided between the two chapels, they were united to the see of Dunblane during the incumbency of Dr Bellenden. The state of the case probably is, that at its institution by James V., who resided frequently at Stirling, the benefice was held by ecclesiastics chiefly resident there. The Chapel Royal is noticed as in full operation in Stirling in 1540. During the reign of Queen Mary, the Chapel Royal seems to have been at Holyrood. In 1574, again, after the Reformation, the name of Johne Duncaneson appears as minister of the Chapell Royall, or King's House at Stirling, where James VI., then very young, resided; while at Holyrood the minister was apparently the regular parish minister of Canongate, and not connected with the Chapel Royal. Afterwards, when the royal residence became fixed at Holyrood, the Dean of the Chapel Royal officiated in the chapel, of which abundant proof exists in the history of the period. The chapel at Stirling was left to decay; whereas during the reigns of James VI., Charles I., Charles II., and James VII., the Chapel Royal of Holyrood was repaired and embellished. The last of the Stuarts laid out considerable sums for the purpose only the year before the revolution. The revenues of the benefice fell to the crown, *jure coronæ*, on the abolition of Episcopacy in 1690, and have since been gifted at the royal pleasure. For a long period, the emoluments were not at all considerable, owing to the practice which existed of giving tacks or leases of the Teinds (q. v.) to the proprietors of the lands at nominal rents. In consequence of the termination of some of those leases in 1841, and the deans being debarred in the gift of the appointment from accepting anything but the full yearly value of the revenues, a very great increase in the emoluments has gradually taken place. In 1841, the amount paid to each of the three deans was only £84, in 1850 it was £700. The present annual rental, which is divided among the three deans, will probably amount to £2400. A large proportion of the whole revenue is drawn from the parishes of Yarrow and Ettrick, and the remainder from parishes in the county of Wigton, Kirkcudbright, and Ayr. A small sum is also drawn from the parish of Crieff, in the county of Perth. The present holders of the office are Dr Norman M'Leod, Glasgow, and Professors Robert Lee (Biblical Criticism) and Crawford (Divinity), of the university of Edinburgh.

**DEAN OF FA'CULTY,** the president of the incorporation of advocates or barristers in Scotland. Like all the other officers of the Faculty, the Dean is elected annually. As a general rule, he is re-elected till he is promoted to the Bench, when he ceases to take part in the deliberations, though not to be a member, of the body. See ADVOCATE.

**DEAN OF GUILD,** in Scotch burghs, was the head of the mercantile body called the Guild-brethren. See GUILD. In former times (1593, c. 180), he was a judge in mercantile and maritime causes within the burgh, but for a very long period he has been rather what might be called a kind of Scotch edile (q. v.). His chief duty is now to see that buildings within the burgh are erected according to law, that they are sufficient, and, in case of their falling into a ruinous condition, to order them to be pulled down. Though in some of the larger burghs the D. of G. is still (3 and 4 Will. IV. c. 76, s. 22) a member of the town-council, *ex officio*, his jurisdiction is altogether separate from that of the bailie-court. In Edinburgh, the D. of G. court, in addition to the D. of G., consists of a council of merchants and tradesmen chosen annually, and of the old or former Dean of Guild. They are assisted by the law assessors of the magistrates of the city. No building can be either erected or demolished, or even materially altered, without a warrant from this court. Opposition to the issuing of the warrant may be offered, either by a private party, or by the procurator-fiscal of the court itself, acting for the public interest. The enforcement of the act 1698, c. 8, as to the height of buildings, the thickness of the walls, &c., lies within the province of the D. of G. court. The judgments of the D. of G. court may be reviewed by the Court of Session.

**DEAN FO'REST,** a picturesque hilly tract, 22,000 acres in extent, in the west of Gloucestershire, between the Severn and the Wye. It is mostly crown-property, and about half of it is enclosed for the growth of timber for the navy. It contains oak, beech, &c. woods; orchards, yielding the famous Styre apple-cider; coal and iron mines; and stone-quarries for building, grinding, and making troughs and rollers. It is divided into six walks. Pop. 10,692, chiefly miners, once a lawless set. The former inhabitants had many ancient privileges—acquired by birth, and by working a year and a day in the Forest—viz., exemption from rates and taxes, free pasturage, right of mining—a sixth of the produce being due to the sovereign, and access to the woods for timber for their works. D. F. is governed by a lord-warden, six deputy-wardens, and other officials.

**DEATH.** It is one of the fundamental doctrines of physiology, that every part of the organism has its own definite term of vitality, and that there is a continuous succession of the destruction of old cells and the formation of new ones in all tissues, and especially in those in which the most active vital changes are going on, as, for example, in the nervous and muscular tissues. Even the most solid portions of the animal frame, such as the bones and (to a less extent) the teeth are undergoing a perpetual although a slower change of this nature; and throughout the whole body, there is a continuous removal of effete or worn-out tissues, and a corresponding deposition of new matter. Every blow we strike, every thought we think, is accompanied by the death and disintegration of a certain amount of muscular or nervous tissue as its necessary condition; and thus every action of our corporeal life, from its beginning to its close, takes place at the expense of the vitality of a certain amount of organised structure. This is termed *molecular D.*, and, within its proper limits, is obviously essential to the life and wellbeing of the organism.

The cessation of the circulation and respiration may be regarded as constituting *somatic D.*, or the D. of the entire organism, which must obviously be shortly followed by the molecular D. of every portion of the body.

We shall now briefly notice the principal modes in which D. occurs. D. happens either from the natural decay of the organism, as in old age, or (and much more frequently) from some of those derangements or lesions of the vital organs which occur in the course of the diseases and injuries to which we are liable. These derangements of the vital organs may occasion various modes of dying. Dr Watson remarks in his *Lectures on the Principles and Practice of Physic*, that life rests on a tripod, whose three vital supports are the *heart*, the *brain*, and the *lungs*. Through the impaired functions of one or more of these organs, the tendency to D. is expressed. This is much the same as Bichat's statement, that 'the mode of dying may begin at the head, the heart, or the lungs.' The functions of these organs are, however, so mutually dependent upon each other, that impairment in the functions of one of them may lead to D., while the mode of dying is chiefly expressed through the functions of another.

When a person loses blood to such an extent that he faints, if the flow of blood be not arrested, the state of fainting or *syncope* continues, and the heart's action ceases. The cause of D. here is, not that the heart is unable to contract, but because its natural stimulus, the blood, does not enter it in sufficient quantity to excite contraction. This is termed D. by *anœmia*. In other cases, the stimulus from blood may be sufficient, but the heart may have lost its contractile power. Such a mode of death is said to be by *asthenia* (Gr. want of power). Many poisons and diseases, due to morbid materials in the blood (as, for example, cholera), prove fatal in this way.

D. may likewise be produced by suspension of the functions of respiration, as when access of the air to the lungs is impeded, or when the actions of the muscles of respiration cease, in consequence of disease or injury of the brain or spinal cord. The first of these modes is known as suffocation or *apnœa*, and we have examples of it in drowning, smothering, choking, strangulation, &c. Forcible pressure upon the chest, such as sometimes happens in great crowds, or as occurs to workmen partially buried by the fall of earth, &c., will cause D. in a few minutes, if movement of the lungs is prevented by the pressure. Tetanus and the poison of strychnine prove fatal in this way.

D. by coma, or beginning at the brain, is caused by obstruction to the circulation through that organ by pressure (as, for example, when there is effused blood within the cranium, or when a portion of bone is depressed in a fractured skull); by clots of blood within the vessels; by various narcotic poisons, such as opium, alcohol in excessive quantity, carbonic acid, &c.

To these forms of dying may be added (according to Dr C. J. B. Williams) *necrœmia*, or D. beginning in the blood, such as occurs in typhoid fevers and in other diseases of a malignant or pestilential kind. In this case, there is complete and general prostration of all the living powers. The blood, the natural source of life to the whole body, is itself dead, and spreads death instead of life. Almost simultaneously, the heart loses its power; the vessels, and especially the capillaries, lose their tone, and congestion takes place in various organs; the medulla oblongata, from which the chief respiratory nerves arise, is torpid; the powers of respiration fail; voluntary motion is almost suspended; molecular nutrition ceases, and is very rapidly followed by general molecular D.; that is to say, structures and even organs die, and begin to undergo decomposition as soon as the pulse and breath have ceased; and indeed, a partial change of this kind may even precede somatic D., as, for example, when parts become gangrenous, &c.

The signs of approaching D. require a brief notice. The mind may be affected in various ways; there may be dulness of the senses, vacancy of the intellect, and extinction of the sentiments, as in natural D. from old age; or there may be a peculiar delirium, closely resembling dreaming, which usually is of a pleasing and cheerful character.

> Saw ye not even now a blessed troop
> Invite me to a banquet, whose bright faces
> Cast thousand beams upon me like the sun?
> *King Henry VIII.*, Act iv. Scene 2.

In dreadful contrast with such visions, are those which haunt the dying minds of others, when it would sometimes almost appear as if the sinner's retribution commenced even on his death-bed.

Dementia or imbecility sometimes comes on shortly before D., and manifests itself by an incapacity of concentrating the ideas upon any one subject, and by an almost total failure of memory. The mental weakness is often exhibited by the pleasure which is derived from puerile amusements. The great dramatist, from whom we have just quoted, notices 'playing with flowers' as a token of approaching dissolution. In the form of delirium, ocular spectra seem frequently to be present, the patient apparently trying to catch some imaginary object.

There is generally well-marked relaxation and incapacity of the muscular system, and the voice is usually weak and low as D. approaches, often dwindling to a mere whisper. The mode in which the action of the heart declines is various; in most diseases of long standing, the cessation of the heart's action is gradual, the rate of the pulsations being much increased, but their energy being very much impaired. In some acute affections, the failure is shewn by the irregularity of the pulse, while the force is little altered. In other cases (especially in cerebral diseases), the heart, before finally ceasing to beat, contracts violently, and suddenly stops.

The respiration is sometimes hurried and panting till just before D., while in other cases it is slow, laborious, and stertorous. The accumulation of mucus, &c., in the air-passages increases the difficulty of breathing; the sound known as the 'death-rattle' being produced by the passage of the air from the lungs through the fluid collected in the trachea and upper respiratory passages.

There is a loss of animal heat, beginning at the extremities. For further information on this subject, we may refer to the article DEATH in *The Cyclopædia of Anatomy and Physiology*, from which we have borrowed some of the matter of the preceding paragraphs.

The *signs of actual D.* may be arranged under three heads: 1. Signs of the extinction of the vital functions; 2. Changes in the tissues; 3. Changes in the external appearance of the body.

1. The arrest of the circulation and respiration would at first sight appear to afford decisive evidence of D.; but these functions, as in the case of hybernating animals, may be reduced to so low a condition that it is by no means easy to decide whether or not they are completely annihilated. In cases of apparent drowning, these functions are frequently suspended and again restored; and cases like that of Colonel Townsend (see any standard work on medical jurisprudence) occasionally occur, in which the patient has the power of voluntarily suspending these functions for a considerable period.

The loss of irritability in the muscular fibres (a fact which may readily be ascertained by a galvanic current) is a sign of far greater importance than either the apparent stoppage of the circulation or of the respiration. The contractility of the skin is also lost after death. When a cut is made through the skin of a dead body, the edges of the wound collapse, while a similar lesion inflicted during life presents an open or gaping appearance.

2. Among the changes in the tissues, the *rigor mortis*, or rigidity of the muscles, which ensues at a

varying period after D., is the most important. It may appear within half an hour after D., or may be delayed twenty or thirty hours, according to the nature of the disease; and its mean duration is from 24 to 36 hours. It commences in the neck and trunk, then appears in the lower, and lastly in the upper extremities, and disappears in the same order.

3. Various changes in the external appearance of the body have been regarded as indicative of D. by different writers; of these, the most important unquestionably is the altered colour of the surface. Livid spots of various sizes may occur from local congestions during life; but the appearance of a green tint on the skin of the abdomen, accompanied by a separation of the epidermis, is a certain sign that life is extinct.

The discrimination of true from apparent D. is obviously not a matter of mere physiological interest. The case of Vesalius, the eminent anatomist, who opened an apparently dead body in which the exposed heart was seen to be still beating, is well known; as also that of the Abbé Prevost, who, having been struck down by apoplexy, was regarded as dead, but recovered his consciousness under the scalpel, and died immediately afterwards; and a French author of the last century, Bruhier, in a work *On the Danger of Premature Interment*, collected 54 cases of persons buried alive, 4 of persons dissected while still living, 53 of persons who recovered without assistance after they were laid in their coffins, and 72 falsely considered dead.

**DEATH,** Punishment of. See Capital Punishment.

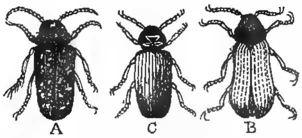
**DEA'TH-BED,** Law of, in Scotland. If any man, whilst suffering from the disease of which he ultimately died, shall have burdened or conveyed away his heritable estate, to the prejudice of his lawful heir, he is presumed to have so acted in consequence of his inability to resist importunity in the state of feebleness to which he was reduced, and his heir is entitled to reduce the deed. This rule, which has no counterpart in England, belongs to the most ancient consuetudinary law of Scotland. As Lord Stair suggests (1, 12, 34, and 4, 20, 38), it probably was intended as a protection to the dying and their lawful heirs against the notorious propensities of the priesthood; and is thus referable to the same principle as the prohibition to convey heritage by will. There are two tests which have been fixed upon by the law as establishing the existence of that degree of vigour which is technically called *liege poustie* (supposed to be a corruption for *legitima potestate*)—viz., survivance for sixty days, and going unsupported to kirk or market, and conducting himself in the ordinary manner. It has been decided that it is of no consequence though the object of the visit were neither to worship nor to buy and sell, but simply to evade the law of death-bed. If the individual was in a condition to take part in the service of the church, or in the trade of the market, that is sufficient. Extreme old age, accompanied by manifest indications of the approach of death, will be equivalent to disease. The absurd part of the law, however, is, that the deed of the oldest or most infirm man, or of the man who is labouring under the most mortal sickness, will not be reducible, if another disease has supervened, of which he dies, or if he be killed by accident.

**DEATH'S HEAD MOTH** (*Acherontia atropos*), a species of Hawk-moth (q. v.), or lepidopterous insect of the family *Sphingidæ*, not uncommon in some parts of England and of the continent of Europe, and very widely distributed over the world, being found in Africa, the Mauritius, and the East Indies. It measures almost five inches from tip to tip of the extended wings; is of a dark colour, the body yellow with black markings, the thorax with pale markings which have some resemblance to a skull, and from which it derives its name; the upper wings mottled with brown, black, and yellow. The caterpillar is greenish-yellow, the back speckled with black, with transverse lines partly blue and partly white; and in countries where the potato is cultivated, is often to be found feeding on the leaves of that plant. This insect is most frequently seen flying about in autumn, and only in the mornings and evenings. It is remarkable for emitting a plaintive squeaking sound, which, with its dark colour, and the skull-like mark on the thorax, has led to its being regarded with superstitious dislike, the sudden appearance of large numbers being popularly held ominous of evil; whilst, in the Mauritius, a notion prevails that it casts a dust from its wings which produces blindness in persons on whom it falls, and its entering an apartment is therefore regarded with dread. How the noise which it emits is produced, is not satisfactorily known. If the insect is taken and confined in the hand, this sound is sent forth sharply and strongly. The D. H. M. is interesting upon still another account, as one of those insects which enter and plunder bee-hives, feeding upon the honey; and although apparently quite defenceless, it enjoys perfect impunity whilst ravaging the stores of creatures so well provided with formidable weapons, and generally so ready to use them against an intruder. No explanation of this fact has yet been found.

Death's Head Moth and Caterpillar.

**DEATHS,** Registration of. See Registration.

**DEA'TH-WATCH,** a ticking sound produced by certain insects, inmates of human dwellings, and which being most readily heard in that stillness which attends times of sickness and anxiety, has become associated with superstitious notions and fears, being regarded as indicative of an approaching death in a house. The most common form of this very prevalent superstition is the belief, that when the D. is heard, some member of the household will die within twelve months. The tickings of the D. were formerly attributed to species of wood-louse and of spider, and it is probable that they are not all produced by insects of the same kind; but the most common D. of Britain is a species of Borer (q. v.), (*Anobium tesselatum*). It is of a dusky or grayish-brown colour, and about a quarter of an inch in length. It is generally in the latter part of spring that its noise is heard, from seven to ten or eleven distinct ticks being given in pretty rapid succession, and this being repeated at uncertain intervals. The noise exactly resembles that made by beating with the nail upon a table; and when this is done, the insect is not unfrequently induced to reply to it. It is the perfect insect, not the larva, which produces this sound. It seems, indeed, to be a call by which the sexes are attracted to each other, and is produced by the insect's beating upon some hard substance with its head, in doing which, it raises itself upon its hind-legs, and with the body somewhat inclined, beats its head with great force and agility against the substance on which it stands. One of them was seen by Mr Stackhouse thus to beat upon a sedge-bottomed chair, with such force that its strokes made little indentations in the outer coat of the sedge.



Death-watch, magnified:
A, Anobium Tesselatum; B, Anobium Striatum; C, Anobium Pertinax.

**DEBACLE**, a French word, meaning in that language the breaking up of the ice in a harbour or river, but introduced into English by geologists to express any sudden flood of water, which bears before it opposing obstacles, and leaves its path marked with confused and scattered fragments of rocks, stone, and other débris.

**DEBA'TABLE LAND**, a tract of land, chiefly level and of a moory character, but now in course of improvement, on the western border of England and Scotland. This tract of country, situated between the Esk and Sark, was at one time claimed by both kingdoms, and hence its name. In 1542, 'it was divided by royal commissioners, appointed by the two crowns. By their award, this land of contention was separated by a line drawn from east to west, betwixt the two rivers. The upper half was adjudged to Scotland, and the more eastern part to England. Yet the Debatable Land continued long after to be the residence of the thieves and banditti to whom its dubious state had afforded a refuge.—The jest of James VI. is well known, who, when a favourite cow had found her way from London back to her native country of Fife, observed, "that nothing surprised him so much as her passing uninterrupted through the Debatable Land."'—Scott's *Minstrelsy of the Scottish Border*. The Græmes, a troublesome clan of freebooters who inhabited the D. L., were transported to Ireland at the beginning of the 17th c., and prohibited from returning on pain of death. See Border.

**DEBA'TE** is an exchange of opinions, differing from conversation in this, that the speakers succeed one another according to certain regulations, and that the subject is treated formally, and in general with a view to coming to some practical conclusion. The term is usually understood of the discussions of political representative bodies. The debates of the English parliament are divided into two stages. The first concerns the general principle of the measure, and is conducted with strict parliamentary formalities; when this is carried, the details are discussed in a committee of the whole House, when a less formal and more free interchange of opinions is admitted. Parliamentary debates are sometimes decried by men of absolute tendencies as useless, and even mischievous. How, it is said, can a couple of speeches, *pro* and *con*, produce a rational conviction on any subject; it is more likely that the judgment will be run away with by specious oratory. But this proceeds upon a false conception of the great object of public D., which, though it seldom influences the votes on the actual question, serves to justify the proceedings of public men to their constituents, and forms one of the chief aliments of public opinion and of the political life of a community.

**DEBE'NTURE.** There are two kinds of documents to which this term is applied, which may be described separately.

*Excise General D.*—This is a certificate authorising the exporter of certain classes of goods to receive a drawback equal in amount to the excise duties which had been paid on them. The object of the document is to certify two things—first, that the excise duties had actually been paid; and, second, that by a certificate from an officer of customs the goods had been shipped, and *bonâ fide* exported to foreign parts, and not relanded in Great Britain. This kind of D. is executed by an officer of excise (Inland Revenue); it is partly printed and partly written on a sheet of stamped paper, for which the exporter pays. As concerns the export of beer, there is an excise D. slightly differing in form.

*Railway D.*—This is the term applied to a deed of mortgage given by a railway company for borrowed money. By virtue of acts of parliament constituting, and giving additional powers to, a railway company, the company is authorised to borrow a specified sum (see Capital Account, also Railways, Legislation and Management). The deed by which the loan is effected is simple in its appearance and nature. It consists of a sheet of paper duly stamped; and its contents, embraced in a single page, are partly printed and partly written. All expenses connected with it, brokerage included, are borne by the company. At the head of the deed is the name of the railway company, in large letters, with the words Mortgage, No. —, and the amount in figures. It then proceeds: 'By virtue and in terms of an act, &c. [the act or acts being recited], We, the —— Railway Company, in consideration of the sum of ————, paid to us by ————, Mortgage the said undertaking, and all the tolls and sums of money arising by virtue of the said acts, and all the estate, right, title, and interest of the company in the same, to hold unto our said assignee, ————, until the said sum of ————, together with interest for the same, at the rate of ———— for every hundred pounds by the year, payable as hereinafter mentioned, be satisfied. And it is hereby stipulated that the said principal sum shall be repayable, and the said company are hereby bound to repay the same on the [here date of repayment is inserted]. But if the parties hereto shall mutually think fit, the same shall thereafter remain as a loan to the said company, for such further period, and at any such rate of interest, as shall be mutually agreed upon by a minute indorsed hereon to that effect, and signed by us and our said assignee, or ————. And in respect of the interest to become due on the said principal sum at and prior to the said [date of repayment], the said company shall pay to the bearer of the interest-warrants herewith issued, the several sums contained in such warrants, at the times therein respectively specified. In witness whereof, these presents written, in so far as not being printed, on the face of this sheet of stamped paper by [here follow the name of secretary of the railway company, the name of place, date, and the signatures of three directors, with the signatures of witnesses.]' Such is a railway debenture. Along with it are given warrants for the payment of interest at the periods specified, which are paid on presentation.

These interest-warrants, which are sometimes called Coupons (q. v.), are small slips of paper bearing the sum, date, and signatures. The object in giving them to the debenture-holder is to save him all trouble. They are paid to any one presenting them.

Brief, simple, and effective, a railway D., with its accompanying interest-warrants, is perhaps the most convenient deed of mortgage ever invented. In few and unequivocal words, it pledges the whole railway for the loan, and it must necessarily be redeemed before any shareholder can claim a dividend from the undertaking—each D. ranking according to its number. Railway debentures are, therefore, reckoned a safe form of investment, and are eagerly taken up by individuals who have sums of a few hundred pounds to lend for several years at a stipulated rate of interest. These debentures possess the further advantage of being saleable, and through the agency of stockbrokers they pass from hand to hand. In the event of neither interest nor principal being paid, the holder is entitled to enforce the mortgage; but this must be done by a suit at law in the competent court; and wherever there is litigation, there are means for protracting a settlement of claims. W. C.

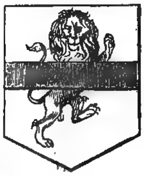
**DEBLAI'**, in Fortification, is any hollow space or excavation in the ground made during the construction of fortifications or siege-works. The cavity itself is the D., while the earth taken from it is the *remblai*.

**DE'BORAH** (Heb. signifies a *bee*), a Hebrew prophetess, the wife of Lapidoth, who lived in the time of the Judges. She dwelt in Mount Ephraim, and uttered her judicial oracles from her tent under the palm-tree between Bethel and Ramah. To deliver her land from the oppressive yoke of the Canaanites, under which it had groaned for twenty years, D. called to her aid Barak, son of Abinoam, probably a man of heroic temper. An army was raised among the tribes of Naphtali and Zebulon, and a battle took place in the plain of Esdraëlon, where the Canaanitish host was completely routed, and Sisera during his flight, as D. had predicted, was murdered by a woman. This victory secured to the Israelites a peace of forty years' duration. The 'Song of Deborah' (as it is generally called, though its composition is not ascribed to her in the Book of Judges) is a choice fragment of primitive Hebrew poetry.

**DEBOU'CHING**, in Military Tactics or evolutions, is the marching out of a body of troops from a wood, defile, or other confined spot, into open ground.

**DEBRE'CZIN**, a large straggling town of Eastern Hungary, situated in the midst of an extensive plain, about 120 miles east of Pesth. Like many of the Hungarian towns, D. is a mere collection of villages, united on no particular plan. The houses for the most part are mean structures of not more than one story in height, and the streets, if such they can be called, being unpaved, are exceedingly dirty; in certain seasons of the year, planks are laid down to enable passengers to cross. Notwithstanding its generally squalid character, however, D. is possessed of some very handsome public buildings, including a town-hall, a Protestant college, with a staff of 24 professors and 1800 students, and several churches, monasteries, and charitable institutions. The inhabitants, who are very industrious, are dependent chiefly on agriculture, but a number of them are engaged in the manufacture of coarse woollens, sheep-skins, leather, earthen-ware, soap, saltpetre, and tobacco-pipes, which are famous throughout Hungary. The cattle and swine markets of D. are among the most extensive in Europe, and its grain-market is also large. The population of D. is usually stated at about 60,000, but the most recent official return, printed at Prague in 1859, gives it at only 13,800, which, if correct, implies unusually repressive measures on the part of Austria in retaliation for the part it took in the struggle of 1848—1849. With the exception of 2000, its inhabitants are all Protestants. They have suffered much on account of their faith, especially in 1567 and 1686. D. took a prominent part in the revolution of 1849, and was for some months in that year the seat of the national diet, after it had been forced to remove from Pesth.

**DEBRUI'SED**, a term peculiar to English heraldry, used to indicate the grievous restraint of an animal, and its being debarred of its natural freedom by having any of the ordinaries laid over it (*Dictionary of Display*).



Debruised.

**DEBT**, that which one person owes to another, or the duty which, as responsible beings, all owe towards God. Life is figuratively spoken of as a loan, and the act of dying is called 'paying the debt of Nature.' More commonly, however, the term D. is limited to money legally due, and exigible by process of law. To speak in legal phraseology, D. may originate either in agreement or by operation of law, or as a consequence of injury, though in the latter case it more commonly assumes the form of a claim for Damages (q. v.). Liquidated D. (in Scotland, liquid), is where the exact amount has been ascertained; contingent D., is where the liability depends on the occurrence of an event which may or may not happen; future D., is where the liability is existing, but the time for payment has not yet arrived. This may, in Scotland, be secured by certain legal processes, entitled Arrestment and Adjudication (q. v.); but in England there is, in general, no method of affixing a liability upon property before the D. becomes payable, except in the case of bankruptcy, when a future or contingent D. may be proved against the estate, as in Scotland. The main division of debts in Scotland, however, is into movable and heritable—the former being in themselves chargeable only upon the debtor's personal funds, although they may, by certain forms of law, be made also a charge upon his real estate; and the latter being directly and immediately a charge upon his real estate. The former are, accordingly, esteemed as personal estate so far as regards succession, while the latter are considered as heritable or real property. In England, also, a D. may be secured on the debtor's real estate, as by mortgage; but the distinction is less material as regards succession, for even mortgages are accounted personal estate in the hands of the creditor. In Scotland, on the other hand, there is no distinction corresponding to the fundamental division of debts in England into simple contract debts and specialty debts. The former are all debts which arise without the intervention of a *Deed* (q. v.), or before judgment; and it is only of late years that they have been made recoverable against the heir of the debtor. Such a D. does not by law carry interest. A specialty D. is one constituted by Deed (q. v.), or by a record of court, as a recognisance, or by a judgment of a court. The former carries interest from its date, and a judgment D. carries interest from the date of the judgment at 4 per cent. It binds all lands of which the defendant is possessed, either in law or equity; but to make this effectual against purchasers, the judgment must have been registered in the Common Pleas, and the registration must be renewed every five years.

**DEBT, ACTION OF,** in England. This lies for the recovery of a debt in its technical sense, of money ascertained in amount due by one to another. Where this has been ascertained by a bond for the amount, or by a judgment of a court, action of debt is in general the only proper action; but in the case of the debt arising from breach of contract under seal, it may generally be sued for either by an action of debt, or by one of covenant; or where the contract was not under seal, by an action of debt, or one of assumpsit. Actions of debt, when on contract under seal, must be brought within 20 years; on other contracts, within six years. The time in both cases is taken from the accruing of the cause of action—i. e., the breach of contract; but if a subsequent acknowledgment in writing has been made by the party liable, or he has paid the debt in part, or paid interest, the time will run from such subsequent act. In an action of debt, the writ by which it is commenced must be endorsed with a note of the amount of the debt, and of the costs of the writ, and an intimation that, if these are paid within four days, no further proceedings will be taken.

**DEBT, NATIONAL,** is the amount which any state admits itself to owe to those who may have advanced money for the use of the government on occasions when its expenditure has exceeded its ordinary income. As in the case of individual debtors, who sometimes engage to pay more than they obtain from the lender, the amount of a national debt may not be the amount which the nation has borrowed; it is often greater, from the necessity of holding out to capitalists, as an inducement to make a large advance, that they will be set down as creditors for more than they have given. On the other hand, it may happen, though of rare occurrence on a large scale, that when money is bearing low interest, a nation may give its creditors the alternative of receiving payment, or allowing a deduction from the nominal amount of their debt, and they may choose the latter as the preferable alternative. When the term, 'the national debt,' is used by itself, it is always understood to refer to that of our own country, which is indeed the heaviest in the world. It amounts, in round numbers, to 805 millions of pounds. The next in amount is that of France. That country having been entirely bankrupt during the first Revolution (see ASSIGNAT), its existing debt may be said to date no further back than the Consulate, when credit was restored. On the first return of the Bourbons, before the battle of Waterloo, it amounted to 123 millions of pounds; it is now 373 millions. The next in amount is that of Russia, estimated at 228 millions. Austria closely follows, being indebted to the extent of 226 millions; and, with all its extent and population, this sum is shewn to be a heavier burden on that empire than nearly four times the amount is on the British, from the circumstance that, while our own finance-minister is able to obtain whatever funds are required for carrying out the national policy, Austria is notoriously restrained by want of money, while her creditors do not feel the security for her existing debt to be quite unquestionable. Perhaps the most heavily indebted European state, in proportion to its means, is Spain, owing upwards of 140 millions. Holland has a debt not far from 100 millions; the country, though small, is very rich, and able like our own to bear a heavy burden. The debt of Prussia is understood to be under 50 millions, and that of the minor German states is trifling.

The national debt of the United Kingdom has arisen along with the supremacy of parliament and the necessity for a standing army. Through the reigns of the Tudors and the Stuarts, the nation's protection against the power of the crown was in the king being unable to keep up a standing army. The force he then commanded consisted of the great vassals of the crown and their feudal retainers, called out to serve for a limited period —a body apt to be wilful, and subject to such fluctuations that it could not be depended on for continuous warlike operations. The House of Commons jealously checked the rise of a standing army, by restricting the means for supporting it. Loans were sometimes obtained or exacted by the sovereign, but they were temporary and of comparatively trifling amount, for the Commons would have considered it an entire sacrifice of the means of protecting the national liberties had they mortgaged to any of these kings the future revenue of the country, so as to enable him to raise a loan and levy an army. But when the control of parliament over the prerogative was strengthened, jealousy in this direction was no longer necessary. Accordingly, it was when parliament triumphed in the Revolution settlement that the national debt began. The first regular loan was obtained in 1693; it consisted of the capital of the newly created Bank of England, amounting to £1,200,000. This accommodation to the government was, in fact, the price paid by the bank for its privileges. As the nation was engaged in an expensive war, this beginning was rapidly followed up, and at the peace of Ryswick, in 1697, the national debt exceeded 20 millions. Before the accession of the House of Hanover in 1714, it had exceeded 50 millions, and the rapid rise of this burden was a strong argument in the hands of the Jacobites against the Revolution settlement. Whenever a loan was negotiated by the government, special terms were offered according to circumstances. In one case, there might be a terminable annuity, say of 60 or 100 years—that is to say, a certain percentage being paid during that period, at the end the debt was to be extinguished by such payments. See ANNUITY. In other instances, there was a perpetual annuity. In a loan negotiated on the latter terms, that annuity was always rather under than above what a borrower would give to a private lender, although such a borrower was bound to repay the money, while the nation was not. It came to pass, in fact, through one of the most curious processes in the whole mystery of finance, that a loan never to be repaid was considered a more eligible investment than a loan to be repaid. The government made this gain—for a distinct gain it was—by the convenience to the public, who, always having money for which they were glad to get the secure interest of the funds, were always ready with a new lender when the old one wanted to be paid. Hence has come the perpetual shifting of the fundholders. And as long as there are moneyed persons who will buy thus into the stocks without any considerable reduction, there is a sure test that the debt is not beyond the capacity of the nation. Raised, however, as we have seen by special loans, each on its own conditions, the different funds became exceedingly varied and complicated. It was one of the projects of the great South Sea schemers of 1720, to conjoin them all into one uniform fund, but this plan was interrupted by the failure of the whole affair. Afterwards, in 1751, a general uniform arrangement was carried out, and the stocks were then called the Consolidated Fund. See CONSOLS. Meanwhile, the progress of the national debt was in round numbers as follows: In 1756, when the war of the Austrian Succession began, it was 75 millions; and seven years afterwards, when this war ended, it was

140 millions. Increased by the American war and the war with France and Spain, memorable by the defence of Gibraltar, it had increased to the amount of 260 millions when, in 1793, the great European war of the French Revolution broke out. At the peace of Amiens in 1803, the debt was 620 millions. When the treaty of Vienna was resumed, after the battle of Waterloo, the amount had risen to 885 millions. It has since decreased, although some further loans have been incurred. The largest of these is connected with one of the most honourable actions of which the British Empire, with all its traditions of glory, can boast—the advance of 20 millions, in 1834, for the emancipation of the colonial slaves. The latest considerable addition made to the national debt was during the Russian war of 1854, when 16 millions were raised by loan. In 1857, the amount of the D. was close to 812 millions, but it has now slightly decreased. According to the latest accessible return to parliament, which comes down to 1860, it amounted to £805,946,508. Of this sum, the amount called 'funded debt' was £789,718,208, and of floating debt in exchequer bills, £16,228,300. The distinction between the two is, that the government do not profess to repay the former—they only give the creditor an annuity, terminable or perpetual, and if he wants payment of his money, he can only get it by selling his right to this annuity; the other consists of temporary loans, liable to fluctuation, and renewed from time to time.

It must be kept in view, however, that from a peculiarity of phraseology, the enormous amount of the national debt is partly fictitious, the whole sum neither having been borrowed nor being virtually due. When capitalists have advanced money, they have been content with a small percentage—3 or 3½—but they have often insisted that for each £100 advanced by them, they should have more than £100 of actual stock. If the condition of the market were such that the capitalist wanted 4½ per cent., and the interest or annuity obtained by him was only 3 per cent., he would insist on having stock to the extent of £150 for his £100. If 5 per cent. interest were paid on the nominal amount of the national debt, it would be a charge of more than 40 millions a year—the actual burden is between 28 and 29 millions. Such is, however, the reliance on the national credit, and the convenience of having the stocks for investment, that the stockholders are content with little more than 3 per cent. interest, the right to an annuity of £3 actually at present (1861) selling for about £90.

The literature of the country has teemed with projects for getting rid of the incumbrance of the national debt, many of which go far wide of the mark, from the supposition that the debt is the incumbrance. In fact, the incumbrance is in the expenditure—the sacrifice of the nation's capital which has caused the debt—the debt itself is merely the shape in which that loss presses, and it must press in some shape. The millions have been exploded in powder and shot, and in other extravagances, and can never be recalled; all that we can do is, by industry and frugality, to make new millions, and replace the loss. Hence it is the supremest folly to suppose that the nation would profit by abolishing or wiping off the national debt—by repudiation, as it is called. Such an event would only be ruin to a large number of people who are in the position of being the nation's creditors, and would perhaps bring ill-gotten gain to a small number. It would be difficult to estimate precisely how such a calamity would act. In the first place, if it were seen to be in prospect, the funds would go rapidly down by the holders selling out, so that as long as the chances of stability would induce any one to buy at a very reduced price, the circle of sufferers would be, as it were, widening. The poorest of those interested would be the chief sufferers in the awful scramble. The working-classes, besides any savings which they might have directly invested in the funds, would lose about 40 millions, which they have invested through savings' banks and friendly societies. Widows and unmarried women with narrow fixed incomes would be the next sufferers. It is unnecessary to go further; for the general paralysis of capital and stoppage of manufacturing industry, along with loss of national reputation, would be incalculably disastrous. There is no way of reducing the national debt, except by saving up through taxation from the expenditure of the country. The process of reduction in this form is, however, always met by the consideration, whether the repeal of a disadvantageous tax, or the reduction of the interest of the D., is the better alternative. One thing is very clear, that from the progress of general wealth and increase of population, the national debt, assuming it to remain at its present amount, is always pressing with less and less severity on the country, and is therefore becoming more and more manageable. Some persons, looking at only one side of the matter, have gone the length of saying that, as a ready and safe means of investment, the national D. is a kind of blessing; though the slightest consideration would have shewn, that it can never be advantageous for the community at large to be taxed to pay interest to a limited number of individuals. Whatever be the incidence of taxation to pay the interest, now amounting in the aggregate to about £26,000,000 per annum, it is the proud boast of England that she has ever kept faith with the national creditors—never, under all her embarrassments, repudiated a farthing of her debt. As a natural consequence, the British funds are sought as a secure means of investment by people of capital in all lands. On the reduction of the D., see the article FUND, SINKING.

**DEBTOR AND CREDITOR, LAWS OF.** In the history of this, as of almost every other branch of jurisprudence, we may, if we will, trace the march of social progress in general. In the earlier stages of life in the state, the arrangements for borrowing and lending are rarely such as to enable the citizens to avail themselves with security of their mutual resources, or to assign such limits to the powers of the creditor as either the claims of humanity or his own true interests demand. On the one hand, lending is confounded with alms-giving; and the exaction of interest, and even of capital, is regarded as an act of inhumanity towards the poor. On the other hand, no sooner do the creditor's rights come to be recognised in anything like a legal sense, than there seem to be no logical grounds on which any limits can be set to them. If he is entitled to exact the debt at all, he is entitled to seize the goods of the debtor; and if the debtor has no goods, he is entitled to his services. But the possession of his services implies the possession of his person; and the possession of his person implies the possession of his life. Moreover, from the exaggerated notions of the domestic ties which usually prevail in early times, the person of the individual, where that individual is the father of a family, brings along with it that of his wife, his children, and his slaves. The creditor thus becomes the absolute master of the life and liberty of his debtor, and of all those who are dependent upon him. The arrangements of the Mosaic Law are an illustration of the manner in which, in the ruder forms of society, the laws of debt thus combine a degree of lenity with a degree of severity which are equally alien to modern views. In this as in many other respects, they are, as Michaelis has pointed out (vol. ii. p. 300), a recognition of the consuetudinary law of the stage of society to which they belonged, rather than a system special to the Jews. If an Israelite became poor, it was a duty to lend to him, and no interest was to be exacted either in money or in produce. If he was a foreigner, the case was different, and the taking of interest was legal (Exod. xxii. 25; Deut. xxiii. 19, 20; Lev. xxv. 35—38). When the Sabbatical year arrived—i. e., at the end of every seven years—there was a general remission of debts as between Israelite and Israelite; and the near approach of the year of remission was not to be recognised as an apology for declining to lend to an indigent brother (Deut. xv. 1—11). Pledges, it is true, might be taken, but even here the same humane principles prevailed. The upper millstone was sacred, for to take it would be to deprive the debtor of the means of subsistence. If raiment was the pledge, it must be returned before nightfall, when it might be required for a covering; and the widow's garment could not be taken in pledge (Exod. xxii. 26, 27). In strange contrast to this is the provision (Lev. xxv. 39) that a poor Israelite may be sold to one possessed of substance, even when modified by the special provision that he shall serve as a hired servant, not as a bond-servant, and shall be set at liberty when the year of jubilee arrived. Michaelis says that the judicial procedure for debt was quite summary, the most important causes being decided probably in a single quarter of an hour; and he remarks that Moses nowhere thinks it necessary to mention how a debt was to be proved before a judge. There was, however, an extensive system of appeal; from the judge over 10, the case was carried to the judges over 50, 100, and 1000, and finally to Moses himself. As every Israelite was entitled to claim the land of his fathers at the jubilee year, and thus to place matters on the footing on which they were after the settlement in Palestine, debts and burdens on land were limited to claims to the fruits of forty-two harvests; but houses, with the exception of those of the Levites, might be sold in perpetuity (Lev. xxv. 29, 30, 32, 33). Children were often given in pledge (Job xxiv. 9), and ultimately into slavery, in payment of debt (2d Kings iv. 1). Subsequent to the Captivity, the pressure of debts upon the poor became so intolerable, that Nehemiah espoused their cause, and insisted on a general remission (Nehem. v.), exacting from the rich an oath that they would never afterwards press for payment. Debts of the character here alluded to probably resembled those which the recipients of parochial relief in our own day owe to the community, rather than debts in the commercial sense. In Matt. xviii., Christ refers to the custom of selling the debtor, his wife and children, and all that he had, in payment, rather as a general custom of all nations, than as one peculiar to the Jews—the 'certain king' being a typical instance of a man of substance.

Both in Greece (Plut. Vita Solonis 15) and in Rome (A. Gell. xx. 1, 19; Liv. ii. 23) the creditor had a claim to the person of the debtor. Previous to the time of Solon, this arrangement had produced consequences at Athens closely analogous to those which afterwards led to the struggles between the patricians and plebeians at Rome; and his abolition of it forms one of Solon's many claims to the character of an enlightened legislator. By the Twelve Tables, it was enacted at Rome that if the debtor admitted the debt, or had had judgment pronounced against him for it, thirty days should be allowed him for payment. At the expiration of that period, he was liable to be given into the hands of his creditor, who kept him sixty days in chains, exposing him from time to time publicly, and proclaiming his debt. If no one stepped in to release him, the debtor at the end of that time might be sold for a slave, or put to death. If there were several creditors, the letter of the law permitted them to cut their debtor in pieces, sharing him in proportion to their claims; but Gellius tells us that no Shylock ever was found at Rome. To treat him as a slave, however, and make him work out the debt, was the common practice; and the children in his power, in accordance with the whole constitution of society at Rome, followed his condition. The lex Pœtelia (326 B. C.) alleviated the condition of the debtors (*nexi*) to the extent, at least, of preventing summary imprisonment, and relieving all debtors, for the future, from being put in chains. There do not seem to have been any public prisons for debtors at Rome, and each creditor, consequently, was the jailer of his own debtor. In this circumstance we probably see the reason of the prominence which was given by the plebeians to a change in the laws of debtor and creditor, on the occasion of their first secession, in 494 B. C.; and subsequently during the whole course of the struggles between the two orders. Whatever we may think of the policy of limiting the rate of interest, as was afterwards done by the laws of Licinius, and had previously been done by those of Solon at Athens, there can be but one opinion in modern times as to the propriety of abolishing the right of private imprisonment.

During the feudal period, the person in general was not attachable for debt, imprisonment being inconsistent with the duties of warlike service, to which every man was bound; and it was for the encouragement of commerce, and in consideration of the merchant having to deal with strangers and foreigners, that it was first introduced by the mercantile communities of Europe (Bell's *Commentaries*, Shaw's ed. ii. p. 1067). By the statute of Merchants, it was enacted, at Acton Burnel, in 1282, that in lending money, a merchant might bring the borrower before the lord mayor of London, or the chief warden of another good town, and cause him to acknowledge his debt and day of payment. A recognisance was then enrolled, and an obligation written by the clerk, and sealed with the king's seal and the debtor's. Failing payment, the creditor was entitled to produce this obligation, and to demand a warrant to seize the person of his debtor, and to commit him to the Tower. The history of the law of imprisonment for debt in this country is stated with great clearness by Mr Bell in the section of his *Commentaries* to which we have just referred, but it is impossible to condense it within the limits of the present article. Further information on the subject will be found under Imprisonment, Diligence, Execution, Sanctuary, Bankruptcy, &c. Generally, it may be stated here, that up to the passing of the later bankrupt acts, the prisons of this country were crowded with debtors. It was ascertained by parliamentary returns, that in the 18 months subsequent to the commercial panic of 1825, 101,000 writs for debt were issued from the English courts. In the year ending 5th January 1830, there were 7114 debtors sent to prison in London, and on that day, 1545 of these were still in confinement. On 1st January 1840, the number of prisoners for debt in England and Wales was 1732; in Ireland, 1000; and in Scotland, 100. The statutes of relief and other causes have reduced the numbers. See the following article.

**DEBTORS, Absconding.** The existing laws for the arrest of debtors absconding from England having been found insufficient, in consequence of the delay which was occasioned in obtaining the necessary process, the 'act to facilitate the more speedy arrest of absconding debtors' (14 and 15 Vict. c. 52) was passed in 1851. The evil was felt chiefly by creditors residing at a distance from London, whose debtors were able to perpetrate frauds upon them by embarking for distant countries from various towns and seaports in England; and authority is consequently given by that enactment to the commissioners of the Court of Bankruptcy acting in the country, and the judges of county courts, except those of the counties of Middlesex and Surrey, to grant warrants for the arrest of absconding debtors. The debt must be certified to amount to twenty pounds or upwards. Any person arrested on a warrant of this kind may, before the issuing of the writ of capias to follow thereupon, pay the debt and costs, which shall be endorsed on the warrant, to the messenger or high bailiff intrusted with its execution; or he may enter into a bail-bond to such messenger or high bailiff, with two sufficient sureties; or, lastly, he may make deposit of the sum endorsed on the warrant, with £10 of costs, in all which cases he shall be entitled to be discharged from custody (s. 5). By a subsequent section (s. 8), another course of proceeding is provided. It is therein enacted that any person against whom such a warrant has been issued, may make application to any commissioner of bankruptcy or county court judge, or to any judge of the superior courts, for a summons or rule calling upon the creditor who shall have obtained the warrant to shew cause why it should not be set aside or vacated, if such application shall be made before arrest, or why the debtor should not be discharged, if he has been arrested; and that it shall be lawful for such commissioner or judge to make absolute, or discharge such summons or rule, and to direct the cost thereof to be paid by either party. Any such order made by a judge may be discharged or varied by the court mentioned in the affidavit of debt, on the application of either party.

Absconding shareholders may be arrested under the provisions of the Joint Stock Companies Act of 1857 (21 and 22 Vict. c. 14, s. 11 and 12), or their goods and chattels may be seized, if there be probable cause for believing that it is their intention to leave the country, or to carry off or conceal their effects.—As to the mode of dealing with absconding debtors in Scotland, see Meditatio Fugæ.

**DEBTORS, Imprisonment of.** Except in the case of fraud, no debtor can be imprisoned in England for a debt below £20, exclusive of costs. But such debtors, if ordered by an insolvent or county court to pay the debt by instalments, or otherwise, may, if they make default, be committed by the court to prison for forty days. In Scotland, the limit below which imprisonment for debt is incompetent is £8, 6*s*. 8*d*. In both countries, if a debtor escapes after arrest, and before imprisonment, the officer of the law charged with the execution of the process is liable for the debt.

**DEBTS, Small.** See Small Debts.

**DEBU'T** (*début*), a French word which has been adopted into the English language, and signifies generally a beginning, or entrance, but is specially applied to the first appearance of an actor or actress on the stage at all, or to a first appearance in a particular theatre. In these circumstances, the actor is called a *débutant;* the actress, a *débutante*.

**DE'CA**, Gr. signifying 'ten,' is of frequent occurrence in composition; as in *Decapolis*, a union of ten cities; *Decalogue*, the ten commandments; *decamètre*, a measure of ten mètres, &c. From *deca* is formed

De'cade, a collection or group of ten. As applied to time, decade was used in the calendar of the French Republic to designate their week of ten days. Each month, of 30 days, was divided into three decades. The days of each decade were named *primidi*, *duodi*, *tridi*, *quartidi*, *quintidi*, *sextidi*, *septidi*, *octidi*, *nonidi*, and *decadi*. The tenth, or *decadi*, was the day of rest; and, as the Republic acknowledged no definite religion, was devoted to the practice of and exhortation to virtue. The republican year numbered 36 decades, and had thus only 360 days. The remaining five (in leap years, six) were devoted as holidays at the end of the year without being numbered.

**DE'CACHORD**, a kind of guitar with ten strings, similar to the common guitar, only larger in the body, and with a broader finger-board. The lower strings have no frets, being only used as open notes.

**DECA'DENCE** (Fr.), a term used with reference to works of art belonging to a school which had passed the period of its highest excellence before they were produced. In Greece, art in all its forms reached its acme in the time of Pericles; and though there are many exquisite works which were produced at a later period, they all belong, more or less conspicuously, to the decadence of Greek art. In Rome, again, both art and literature culminated in the time of Augustus, and from that time we have a decadence, which soon becomes very obvious and rapid. The school of the *Renaissance*, again, came to perfection with Raphael; even the Caracci belong to its decadence; and the decline was continuous through the *rococo* of Louis Quinze, till art became almost extinct all over Europe. In the beginning of the reign of George IV., it probably reached as low a point in England as it ever attained in any civilised country; and it is only within the last twenty years that it has begun to revive. Let us hope that its decadence is far distant.

**DE'CAGON** is a plane geometrical figure of ten sides. When the sides are equal, the figure is called a regular decagon. A decagon may be formed from a Pentagon (q. v.), by forming any irregular triangles on its sides in such a way that no two of them shall have their sides in the same straight line. A regular decagon is got from a regular pentagon by describing a circle round the latter, bisecting the arcs between its angular points, and drawing lines joining the angular points to the points of section.

**DECAI'SNEA**, a genus of plants of the natural order *Lardizabalaceæ*, nearly allied to *Stauntonia*. It contains only one known species, recently discovered, a native of the Himalaya mountains, where it grows at an elevation of 7000 feet. It is a very remarkable plant, and the only one of its natural order which is not a climber. It sends up from the root several straight erect branches like walking-sticks, which bear spreading pinnated leaves, two feet long, standing out horizontally. The flowers are unisexual, green, and in racemes. The fruit is yellow, resembles a short cucumber, being about four inches long, and one inch in diameter. It is full of a soft milky pulp and large black seeds. Two or three fruits grow together. The pulp is sweet and wholesome, much eaten by the natives of the Himalaya.

**DE'CALOGUE** (Gr. *Dekalogos*, 'ten discourses') is the term usually applied by the Greek Fathers to the law of the two 'tables of testimony' given by God to Moses on Mount Sinai. These tables were made of stone, and the commandments inscribed thereon are said to have been 'written by the finger of God.' The commandments are not numerically divided in the Pentateuch, and it has been supposed by some that the number *ten* was chosen, because ten was considered the most perfect number. As, however, there *are* ten distinct injunctions, it is superfluous to allege any other reason for the division than the simple fact, that this is the correct enumeration. Philo-Judæus divides them into two *pentads*, the first ending with 'Honour thy father and mother,' &c.; but the general opinion among Christians is, that the first table contained those which enjoin upon us our duty to God (comprising the first four), and the second, those which enjoin upon us our duty to our fellow-creatures (comprising the last six). The Talmudists make the introductory words, 'I am the Lord thy God, who brought thee out of the land of Egypt, out of the house of bondage,' to be the first commandment, and in consequence, to keep the number *ten* are obliged to run the next two into one. But the words quoted obviously contain no *command* at all, but merely express the grand general reason why the Israelites should yield implicit obedience to the injunctions which follow. Hence Origen commences the D. with, 'Thou shalt have no other gods before me.' His division is that in use in the Greek, and in all the Protestant churches except the Lutheran; while from the writings of Philo and Josephus, it appears that such was also the received division of the Jewish Church. The Masoretic division is that which is adhered to in the Roman Catholic and Lutheran Churches. According to it, the first two commandments, that concerning the worship of God, and that concerning the worship of graven images, constitute but one. The number ten, however, is here also preserved by dividing the tenth into two, the first of which is made to be, 'Thou shalt not covet thy neighbour's house,' and the second, 'Thou shalt not covet thy neighbour's wife, nor his manservant,' &c., to the end. There are two versions of the D. in the Pentateuch; the first is contained in the 20th chapter of Exodus, the second in the 5th chapter of Deuteronomy. These are substantially and almost verbally the same, except in regard to the fourth commandment, for the observance of which the reason assigned in the former differs entirely from that in the latter.

**DECANDOLLE**, Augustin Pyrame, one of the most eminent of botanists, was born at Geneva, 4th February 1778, and was descended from an ancient noble family of Provence, which was compelled to seek refuge in Geneva from religious persecution about 1558. His father was a syndic of Geneva, and had an estate near Yverdun, where much of D.'s boyhood was spent. He received his education in the gymnasium of Geneva, distinguished himself by his attainments in classical scholarship and his love of poetry, as well as by his delight in the study of history, to which and to the profession of law he proposed to devote himself. But after he had begun his studies for this profession, the union of Geneva with the French Republic in 1798 made such a change in his prospects, that he thought proper to relinquish it for that of medicine; having also in the meantime learned to delight in the physical sciences, particularly chemistry and botany, to which the lectures of Vaucher at Geneva in 1796 very much contributed. From this time forth, these were the great pursuits of his life, and he never ceased to study and investigate the relations of these two sciences to each other. He went to Paris, where he prosecuted his studies, and where his botanical publications soon won for him a distinguished place among the scientific men of his time. A work on Succulent Plants (Par. 1799—1803), one on the species of *Astragalus* (Par. 1802), and some less important works, were followed by his extremely valuable *Essai sur les Propriétés Médicales des Plantes* (Essay on the Medicinal Properties of Plants), (Par. 1804). In 1802, he was called to a professorship in the Academy of Geneva, but preferred to remain in Paris, and delivered his first botanical lectures in the Collége de France. In 1804, appeared the first volume of his *Flore Française.* Employed by the government, he visited all parts of France and of the kingdom of Italy in 1806—1812, investigating their botany and agriculture; but the events of 1814 prevented the production of the great statistical work in which it was intended to embody the results of these investigations. On the fall of Napoleon, he was compelled to retreat to Geneva, where a professorship of botany was founded for him, and where he spent the remainder of his life. His *Théorie Elêmentaire de Botanique* (Par. 1813) was followed by two other works, the fruits of his studies in systematic botany and the properties and natural affinities of plants, and by which the true knowledge of that science has been wonderfully promoted, his *Regni Vegetabilis Systema Naturale* (2 vols., Par. 1818—1821), and his *Prodromus Systematis Naturalis Regni Vegetabilis* (vols. 1—10, Par. 1824—1846). D.'s labours established on a surer basis, and improved in many of its most important respects the natural system of botany which Jussieu had attempted to found. See Botany. The latter years of D.'s life were years of sickness and suffering, and he died of dropsy on 9th September 1841. He bequeathed his collections—including a herbarium of more than 70,000 species of plants—to his son, Alphonse Decandolle, on condition of his keeping them open to the public, and of his carrying on the *Prodromus.* To the completion of this work the younger Decandolle has accordingly devoted himself. He also is a botanist of no mean fame, and author of several botanical works, among which an Introduction to the Study of Botany (2 vols., Par. 1835) and a monograph of the *Campanulas* (Par. 1830) particularly deserve to be noticed.

**DECAPITA'TION.** See Capital Punishment.

**DECAPODA.** See Crab and Crustacea.

**DECAZEVILLE**, a town in the department of Aveyron, south of France. It has extensive blast-furnaces and ironworks, said to be superior to any in France, and which, with the iron and coal mines of the neighbourhood, afford employment to the mass of the inhabitants. Pop. 7272.

**DE'CCAN** (Sans. *Dakshina*, the south), a term applied sometimes to the whole peninsula of Hindustan to the south of the Vindhya Mountains, which separate it from the basin of the Ganges, and sometimes restricted to that portion of the same which is rather vaguely bounded on the north by the Nerbudda, which falls into the Gulf of Cambay, and on the south by the Kistna or Krishna, a tributary of the Bay of Bengal. Independently of this indefiniteness of meaning, the name, like that of the Carnatic (q. v.), is rather of historical interest than of actual use.

**DECE'MBER**, the last month of the year. In the old Roman calendar, before the time of Julius Cæsar, the year began with March, and that which is now the twelfth, was then the tenth month; hence the name (*decem*, ten). Our Saxon ancestors called it *Mid-winter-month* and *Yule-month.*

**DECE'MVIRI.** The most famous body known under this title were the ten persons who were appointed as a sort of legislative committee, to draw up a code of laws at Rome. The ground-work on which the D. proceeded, was the information which had been previously collected by three commissioners who were sent for that purpose to Greece. On the return of the commissioners, after a year's absence, a violent dispute arose between the patricians and plebeians as to which of the orders should be intrusted with the revision of the laws. The dispute ended in favour of the patricians, and ten patrician lawgivers were consequently appointed, to whom, moreover, the whole government of the state was intrusted during the year for which they were to hold office. The experiment was eminently successful; the work of legislation was carried on with zeal and success, and the state was governed with prudence and moderation. Their labours not being quite finished, a new body of D. was appointed; only *one*, the notorious Appius Claudius, belonging to the previous commission. In their magisterial and executive capacities, the new D. acted in the most tyrannical manner. In place of the fasces alone being carried before the decemvir who presided for the day, as on the former occasion, each of the ten was now attended by twelve lictors, who carried not only the rods, but the axe which was the emblem of sovereign power. Every species of outrage was committed on the persons and families of the plebeians, and when the term of their appointment expired, the D. refused either to resign or to allow successors to be appointed to them. At length, the iniquitous decision of Appius Claudius (q. v.) in the matter of Virginia brought affairs to a climax. A popular insurrection broke forth, the D. were driven from their office, and the tribunes and other ordinary magistrates of the republic were reappointed. The occurrence is the subject of one of Macaulay's most spirited *Lays of Ancient Rome.*

**DECE'NNARY.** See TITHING.

**DECE'PTION ISLAND,** near South Shetland, in the Antarctic Ocean, is worthy of notice for the contrarieties which it presents. Under the reign of all but perpetual winter, it possesses hot springs and a volcano. In these contrasts it so far resembles Iceland with its Hecla and its geysers. But D. I. seems to be peculiar in this, that its very material consists of alternate layers of ashes and ice. It contains a deep lake of five miles in circuit.

**DECI'DUOUS TREES** (Lat. *de*, and *cado*, falling off) are those which annually lose and renew their leaves. In cold and temperate countries, the fall of the leaf in autumn, and the restoration of verdure to the woods in spring, are among the most familiar phenomena of nature, connecting themselves also very intimately with the feelings, habits, and circumstances of mankind. The greater part of the trees and shrubs of temperate regions are deciduous; but within the tropics, the forest retains always its luxuriance of foliage, except in countries where the diversities of condition, occasioned by the wet and dry seasons, are extreme, and there many trees lose their leaves in the dry season, from causes apparently the same with those which produce the same effect on the approach of winter in colder countries, and which are connected with a sort of rest of the plant, or partial suspension of the active functions of vegetable life. Trees not deciduous are called EVERGREEN (q. v.).

**DE'CIMAL FRA'CTIONS** (Lat. *decem*, ten) are such as have for their denominator any of the numbers 10, 100, 1000, &c.—i. e., any power of 10. See FRACTION. Thus, $\frac{7}{10}$, $\frac{23}{100}$, $\frac{19}{1000}$, are decimal fractions. In writing such fractions, the denominator is omitted, and the above stand thus: 0·7, or ·7, ·23, ·019. That these numbers do not express integers is intimated by the point to the left; and the denominator is always 1, with as many ciphers annexed as there are figures in the decimal. A cipher is prefixed to 19, because otherwise it would read as if it stood for $\frac{19}{100}$. The expression £5·647 is read, Five pounds and 647-thousandths of a pound; or, Five pounds, and six-tenths, four-hundredths, and seven-thousandths of a pound. That these two readings are equivalent appears from this, that $\frac{647}{1000} = \frac{600}{1000} + \frac{40}{1000} + \frac{7}{1000} = \frac{6}{10} + \frac{4}{100} + \frac{7}{1000}$. It thus appears that the first figure of a decimal to the left expresses tenths of the unit; the second, hundredths; the third, thousandths, &c. In this property lies the great advantage of decimal fractions; they form merely a continuation of the system of notation for integers, and undergo the common operations of addition, multiplication, &c., exactly as integers do. To explain the principles which determine the position of the decimal point after these operations, belongs to a treatise on arithmetic.

The disadvantage attending decimal fractions is, that comparatively few fractional quantities or remainders can be exactly expressed by them; in other words, the greater number of common fractions cannot be *reduced*, as it is called, to decimal fractions, without leaving a remainder. Common fractions, such as $\frac{1}{2}$, $\frac{2}{3}$, $\frac{1}{4}$, $\frac{3}{7}$, $\frac{9}{25}$, for instance, can be reduced to decimal fractions only by multiplying the numerator and denominator of each by such a number as will convert the denominator into 10, or 100, 1000, &c. (The common process is merely an abridgment of this.) But that is possible only when the denominator divides 10, or 100, &c., without remainder. Thus, of the above denominators, 2 is contained in 10, 5 times; 4 in 100, 25 times; and 25 in 100, 4 times; therefore, $\frac{1}{2} = \frac{1 \times 5}{2 \times 5} = \frac{5}{10} = \cdot 5$; $\frac{1}{4} = \frac{1 \times 25}{4 \times 25} = \frac{25}{100} = \cdot 25$; $\frac{9}{25} = \frac{9 \times 4}{25 \times 4} = \frac{36}{100} = \cdot 36$. But neither 3 nor 7 will divide 10 or any power of 10; and therefore these numbers cannot produce powers of 10 by multiplication. In such cases, we can only approximate to the value of the fraction. Thus, 10, 100, 1000, &c., divided by 3, give 3, 33, 333, with a remainder in each case; and $\frac{2}{3} = \frac{2 \times 333}{3 \times 333} = \frac{666}{999}$. As this denominator is nearly equal to 1000, $\frac{2}{3} = \frac{666}{1000}$, or ·666 nearly. As 10, and therefore its powers, are composed of the two factors 2 and 5, it is obvious that any fraction whose denominator contains any other factor than these, cannot be reduced exactly to a decimal fraction.

**DECIMAL NOTA'TION.** See NOTATION.

**DECIMAL SY'STEM.** This name is applied to any system of weights, measures, money, &c., in which the standard unit is divided into tenths, hundredths, &c., for the denominations below it, and multiplied by 10, 100, &c., for those above it. The nature of this method of division will be best explained by an example from the French system, where it has been most rigidly carried out. The *mètre* (= 39·37 English inches) is the unit of length, and the foundation of the whole system. For the higher denominations of length, the Greek words *déca*, *hecto*, *kilo*, and *myria*, are prefixed to signify *multiplying* by 10, 100, 1000, 10,000; so that *décamètre* = 10 mètres, *kilomètre* = 1000 mètres, &c. The Latin words *déci*, *centi*, *milli*, on the other hand, are used to express *division* by 10, 100, &c., and thus furnish names for the lower denominations; *décimètre* = $\frac{1}{10}$ of a mètre, *centimètre* = $\frac{1}{100}$ of a mètre, &c. Similarly with money; the *franc* being the unit, a *décime* is the tenth part of a franc; and a *centime*, the hundredth part.

In regard to money, the decimal division is now adopted in many countries. Belgium, Switzerland,

and Piedmont have adopted both the French franc as the standard unit and the division into tenths. In Lombardy, the *lira* is divided into 100 *centesimi;* the Roman *scudo* is divided into 10 *paoli*, and the paolo into 10 *bajocchi;* the Dutch *gulden*, into 100 *cents;* the Russian *ruble*, into 100 *kopeks;* and in America, China, and Japan, the *dollar*, into 100 *cents*.

This plan of decimal gradation in weights and measures is the only rational one, because it is in accordance with the universally adopted decimal notation. If thoroughly carried out, the facilities it would afford in every department of life are scarcely calculable. For one thing, it is not too much to say that one-half the time now spent in Great Britain in learning arithmetic might be saved. That study might, in addition, be made an effective means of intellectual discipline; whereas at present the time must be spent in acquiring something like a ready but blind application of complicated rules.

The most striking instance, perhaps, of the inconvenience of the arbitrary mode of division is furnished by the thermometer. In this case, nature has fixed the fundamental measure, and made it the same for all nations—the interval, namely, between the freezing and boiling points of water. And yet, in England, this space is divided into 180 parts or degrees; in Germany and the continent generally, into 80°; and only in France has it been divided into 100°. Thus, the basis of uniformity made to our hand has been thrown away, and every observation of temperature made in one country has to be painfully translated before it can be understood in another.

**DECIMA'TION**, a military punishment, rarely inflicted in the present day. When a considerable body of troops committed some grave military offence, which would be punished with death if committed by an individual, the punishment was awarded to one-tenth of them by lot, instead of to the whole number, in order that the army might not be too much weakened.

**DE'CIMI**, in Music, is an interval of ten diatonic degrees, as from C to E, or third above the octave, as which it is always treated in harmony. There are only two cases in which it is treated differently from the third: 1st, in double counterpoint, where a necessary difference must be made although the same harmonic rules apply; and 2d, in thorough-bass, where the figure 9 shall rise a degree to 10, instead of falling a degree to 8.

**DE'CIUS**, C. MESSIUS QUINTUS TRAJANUS, a Roman emperor, was born at Bubalia, in Lower Pannonia, towards the close of the 2d c., and was the first of a line of monarchs who claimed descent from an Illyrian stock. Being sent in 249 A. D. by Philippus, the ruling emperor, to restore to subordination the army of Mœsia, which was in a state of revolt; the troops proclaimed him emperor against his will, and forced him to march upon Italy. Philippus encountered the forces of D. near Verona, but was defeated and slain. D. assumed the government of the empire in the end of the year 249 A. D., but his brief reign was one of restless warring with the Goths, fighting against whom he was killed near Abricium, in the close of the year 251. During the reign of D., it was determined to revive the censorship, and to persecute the Christians, in order by the first to check the growing immorality of the state, and by the second to bring back the purity of the Roman religion, and regain for Rome the favour of the gods. The censorship was never fully restored, but a barbarous persecution of the Christians took place. In Rome, Antioch, and Jerusalem, the several bishops were massacred; Origen, famous among the early Fathers, was subjected to the most acute tortures; dreadful cruelties were also perpetrated at Alexandria. Many Christians, in Africa, disowned their religion, until the persecution had passed.

**DECK** is a nearly flat planked covering to a ship, forming a flooring to the persons above it, and a shelter to those below it. There may be several such in a ship, one under another; not only does each serve the purposes here named, but it helps to strengthen the vessel, by holding the sides together. In ships of war, the number of decks varies with the rate or size. First and second rates have three whole decks, stretching throughout from stem to stern; besides two partial decks called the *forecastle* and the *quarter deck*. The space between these two partial decks, which renders the upper D. open to the sky, forms the *waist* of the ship. Smaller ships have two whole and one half decks; while a still smaller class have only one of each.

Where there are several decks in a ship, they are distinguished by different names. Thus, the *quarter* D. stretches over that part of the upper D. which extends from the stern to the gangway. The *upper* or *main* D. has just been adverted to. The *middle* or *second* D. is next under the main D., and is rather thicker and stronger. The *lower* or *first* D. is in the broadest part of the ship, and is made very strong, to receive the heaviest guns. The *orlop* D. is the lowest of all, and is often only temporary; it is chiefly occupied as store-rooms. Some of the above are wanting in all but the largest ships; and other names are occasionally substituted.

**DECKANEE' HEMP.** See HIBISCUS.

**DE'CKER**, SIR MATTHEW, BART., a political economist, was born at Amsterdam towards the close of the 17th century. He came to London in 1702, was naturalised as an English subject in the following year, and having embarked in commerce, attained the greatest success; received a baronetcy in 1716, and three years afterwards, took his seat in parliament as member for Bishop's Castle. He sat in the House, however, only for four years. His death took place March 18, 1749; the baronetcy then became extinct, and his daughters succeeded to his estates.

D., in 1743, published a pamphlet, which in twelve years ran through seven editions, in which he proposed to raise all the public supplies from one single tax—namely, a tax upon houses. According to D.'s calculation, there were then in England, exclusive of Wales, 1,200,000 houses; of these he meant to tax only one-half, counting off 500,000 as inhabited by the working-classes, and 100,000 as being uninhabited. By this means, he proposed to raise an annual revenue of £6,000,000, which sum was £1,000,000 more than the expenses of the government of that day required. The surplus was to be applied as a sinking fund for the purpose of discharging debt.

**DECLAMA'TION** (Lat. *declamare*, to speak loudly, hence to exercise one's self in rhetorical delivery), is the art of speaking according to rules, whereby the sense of the words, as well as the feeling and sentiment, is naturally and characteristically represented. Recitation, therefore, whether spoken or sung, is subject to the laws of D., from which it derives its value and significance. Perfect D. implies correctness of speech, distinctness and clearness of enunciation, and a well-toned voice. D. is therefore clearly of a musical nature. In music, however, D. is so far different from the D. of speaking, that the singer must adhere to what the composer has written, as it is the latter who fixes the whole of the intonation, modulation, and phrasing, and also the *tempi* and expression, and who not unfrequently sacrifices the correctness of the D. to the charm of some peculiar melodic phrase or pleasing rhythm, or a vocal musical embellishment. The truth and beauty of correct musical D. are always endangered by a translation of the original words into another language, a work which, with the greatest care and ability, it is in many cases almost impossible to accomplish word for word, or syllable for syllable, so as to fit accurately to the accent of the music. The master-works of many great composers suffer much in this respect, at which our musical public seem quite indifferent, while listening to translations of operas so carelessly executed as to destroy their greatest beauties, and frequently altogether to distort the sentiment. In earlier times, as well as now, considerable trouble has been taken to establish D. as a science. The ancients had a kind of note, or sign of intonation, which they placed over or under the words, possibly to decide whether the accent should be given by a high or by a low tone, and thus to regulate the modulation of the voice. That the theatrical D. of the ancients resembled the musical recitative of the present day, is generally admitted. In the German language, there are numerous works written on the art of declamation.

**DECLARA'TION**, in Common Law, the pleading in which the plaintiff in an action at law sets forth his case against the defendant. The plaintiff may declare as soon as the defendant has made appearance in answer to the Writ of Summons (q. v.), or, where the summons is not specially indorsed (q. v.), on failure of the defendant to make appearance. If the plaintiff fails to declare within a certain time, the defendant may obtain judgment of *Non Pros.* (q. v.); and if the failure continue for a year after the writ of summons is returnable, the plaintiff is deemed out of court. On application to a judge, a plaintiff, if not prepared, may obtain time to declare; and a defective D. may be amended. The D. must be entitled on the face of it of the proper court, and of the day, month, and year in which it is pleaded, and bears the Venue (q. v.) in the margin. In the name and number of the parties, and in the character in which they sue or are sued, the D. must correspond with the writ of summons. The D. states succinctly in one or more counts, each count in general setting forth a separate cause of action, the facts of the plaintiff's case, for which he claims redress. Any irrelevant matter will be struck out at the cost of the plaintiff. In case appearance has been made for the defendant, the D. will be delivered to him or his attorney. If no appearance has been made, the plaintiff may proceed to obtain judgment by default. See JUDGMENT, DEFAULT, PLEADING.

**DECLARATION**, in lieu of an oath. Quakers, Moravians, and Separatists, who object to swear on religious grounds, have been permitted by several statutes to substitute a simple D., or *affirmation*, as it is called, for an oath. See AFFIRMATION. The members of all other Christian sects may still be compelled to swear, whatever be their scruples, in criminal cases. But as regards civil cases, it was enacted by the Common Law Procedure Act of 1854 (17 and 18 Vict. c. 125, s. 20), that any person who should declare that the taking of an oath is, according to his religious belief, unlawful, should be entitled to substitute an affirmation, or D., and that persons making a false affirmation should be subject to the same punishment as for perjury. In the following year (1855), these provisions were extended to Scotland by 18 Vict. c. 25, s. 1; and by s. 2, the Queen is empowered, by an order in council, to direct the provisions of the act to be applied to all courts in Scotland; by which would seem to be meant all courts other than the 'courts of civil judicature' mentioned in the first section, i. e., to all criminal courts.

**DECLARATION**, DYING. The rule that secondary or hearsay evidence is inadmissible, suffers an exception, both in England and Scotland, in the case of a declaration made by a person under the conviction of his impending death, and who does not survive the trial. Such declarations are of peculiar value for the ends of justice, where the party emitting them dies of injuries which are the subject of the prosecution. In cases of murder, the dying D. of the sufferer as to the circumstances of the crime is always admitted as evidence on the trial of the prisoner, provided that it was deliberately emitted while the deceased was in possession of his faculties, and that it is proved by credible witnesses. If it be possible, the dying D. should always be committed to writing, and tested in the most complete manner that is consistent with the circumstances in which it is emitted. In cases of necessity, however, it may be proved by parole evidence. As to the other cases in which secondary or hearsay evidence is admissible, see EVIDENCE.

**DECLARATION IN CRIMINAL PROCEEDINGS.** In Scotland, the statement made by the prisoner before the magistrate (see STATEMENT) is called his declaration. It is the duty of the magistrate to take this D. immediately on the prisoner being brought to him—that is to say, if he is in his sober senses. The magistrate must previously inform him that it is entirely at his own option to declare or not, but that if he chooses to declare, the D. may be used in evidence against him on his trial. In practice, the examination is generally conducted by the procurator-fiscal, who knows more of the facts of the case than the presiding magistrate. It is taken down by the clerk of court, the magistrate usually dictating to him the form of words which he conceives will most accurately convey the meaning of the prisoner, in case of his statement being of such a rambling description as to render the writing down of the very words impossible. The D. ought to contain the name, age, and designation of the prisoner, the parish and county in which the crime is said to have been committed, and all similar particulars. When completed, it must be read over to the prisoner, who, if he is able to write, signs every page of it along with the magistrate. If he cannot or will not write, the magistrate signs it in his stead. There must, moreover, be two witnesses present, who shall sign the D., and who, if necessary, can speak to the manner in which it was taken. If the prisoner does not understand English, a sworn interpreter must be employed. The D. will be incompetent to be produced as evidence if the magistrate has delegated the duty of taking it to his clerk, or to any one not a magistrate. As the D. is not emitted on oath, it will not be allowed to be produced or used for the purpose of criminating any one else whom the prisoner may have named as a participator in his crime.

**DECLARATION OF RIGHT.** See RIGHT.

**DECLA'RATOR**, a form of action in the Court of Session in Scotland, the object of which is judicially to ascertain a fact, leaving its legal consequences to follow as a matter of course. Such are declarators of property, of contravention under an irritancy in an Entail (q. v.), of non-entry, of marriage, of bastardy, and many others. The declaratory conclusions of such actions are generally followed by petitory or possessory ones, for the purpose of giving effect to the right declared; but this is by no means necessarily so. A substantial interest on the part of the pursuer must, however, in all cases be shewn, as it is not competent to ask the court to declare a mere abstract fact or right. The existence of this special form of action has contributed to diffuse in Scotland a false view as to the nature of actions and judicial proceedings generally, from which many even eminent lawyers have not been free. It is said that decrees upon actions properly declaratory 'confer no new right, but only declare that a right exists in the pursuer,' as if in this case they were an exception to decrees in general, whereas it is obvious that no decree can confer a new right on the pursuer, otherwise than by committing an act of injustice against the defender. In England, there are no actions of D., an arrangement often wondered at in Scotland, but in which the English seems to be more logical than the Scotch law, inasmuch as all actions are actions of declarator.

**DECLE'NSION**, a grammatical term applied to the system of modifications called *cases*, which nouns, pronouns, and adjectives undergo in many languages. How the words Declension (Lat. *declinatio*, a declining, or leaning away) and Case (Lat. *casus*, a fall) came to be applied to this species of inflection, has never been made altogether clear. The relations in which one thing stands to other things may be expressed in either of two ways. Some languages make use of separate words, called prepositions; in others, the relations are expressed by changes in the termination of the name of the thing. Thus, in Latin, *reg* being the root or crude form of the word for 'king,' *regs*, or *rex*, is the word in the nominative case, signifying 'a king' as subject or agent; *regis*, in the genitive case, 'of a king;' *regi*, in the dative, 'to a king,' &c. An adjective joined to a noun, usually takes a corresponding change. The number of cases is very different in different languages. The further we go back in the history of the Indo-European languages, the richer do we find them in these modifications. Sanscrit had eight cases, Latin six, and Greek five. The names of the Latin cases, which are often used also in regard to the English language, are—the Nominative, which names the subject or actor; the Genitive, expressing the source whence something proceeds, or to which it belongs; the Dative, that to which something is given, or for which it is done; the Accusative, the object towards which an action is directed; the Vocative, the person addressed or called; and the Ablative, that from which something is taken. The Greek has no Ablative case. The Sanscrit, in addition to the Latin cases, has an Instrumental case, and a Locative case. The grammar of the inflecting languages is complicated by the circumstance, that all nouns do not form their cases in the same way. This makes it necessary to distribute nouns into various classes, called 'declensions.' In Latin, as many as five declensions are usually given. See INFLECTION. As we descend the stream of time, the case-endings become rubbed off, as it were, and prepositions are used in their stead. The languages descended from the Latin (French, Italian, &c.) have lost all the cases of nouns and adjectives. The Gothic languages, of which Anglo-Saxon is one, had cases almost as numerous and perplexing as those of the Latin. German is still to a great extent encumbered with them. English has only one case in nouns different from the nominative—namely, the genitive, or possessive. See NOUN. The declension of Pronouns (q. v.) has been more persistent than that of nouns and adjectives. Languages of the agglutinating order have, in general, a great abundance of cases. In Finnish, nouns have fifteen cases. Thus, *karhu*, a bear; *karhun*, of a bear; *karhuna*, as a bear; *karhutta*, without bear; *karhussa*, in the bear; *karhusta*, out of the bear, &c. In the Magyar, twenty cases may be reckoned; and the languages of the North American Indians are richer still—perhaps we should say, more embarrassed. What case-endings and other inflectional terminations were in their origin, as well as the comparative merits of the highly inflected and the analytic languages, will be considered under INFLECTION.

**DECLINA'TION.** If a great circle be drawn through the pole of the heavens and any star, the D. of the star is the portion of the circle intercepted between the star and the equator. See POLE. The place of a point in the heavens is determined by its right ascension and D., just as a point in the earth's surface is determined by its latitude and longitude.

**DECLINATION NEEDLE.** When a magnetic needle is suspended or made to rest on a point so as to be free to move in a horizontal plane, it finds its position of rest in a line joining two fixed points on the horizon; and when made to leave that position, after several oscillations, it returns to it again. At certain places on the earth's surface, these two points are the north and south points of the horizon; but generally, though near, they do not coincide with these. A vertical plane passing through the points on the horizon indicated by the needle, is called the magnetic meridian, in the same way that a similar plane, passing through the north and south points, is known as the astronomical meridian of the place. The angle between the magnetic and astronomical meridians is termed the declination or variation of the needle. Thus, if NS (fig. 1) be the line of the astronomical meridian, and *ns* the line joining the poles of the needle, the angle NC*n* is the declination. The declination is east or west according as the magnetic north lies east or west of the true north. Instruments for determining magnetic declination are called declination needles or declinometers. In this instrument there are two things essential—the means of ascertaining the astronomical meridian, and a needle for shewing the magnetic meridian. Fig. 3 represents a common form of the declinometer. Upon a tripod provided with levelling screws stands the pillar P, to which is fixed the graduated azimuthal circle CC. The compass-box B, with the vernier V, attached to it, moves on the azimuthal circle by means of a pivot at the pillar P. Two uprights, U, U, are fixed to the side of the compass-box, on the tops of which rests the axis of the telescope T. A graduated arc A, is fixed to the bottom of one of the uprights, and the angle of elevation of the telescope is marked by the vernier on the arm E, attached to the axis of the telescope. A level L, is also hung on the axis of the telescope, for adjusting the instrument. Inside the compass-box is another graduated circle F, the line joining the zero-points of which is parallel to the axis of the

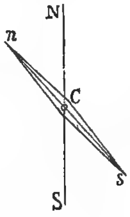


Fig. 1.

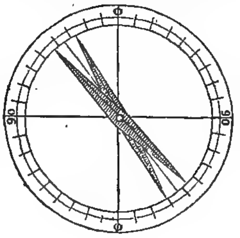


Fig. 2.

telescope. All the fittings are in brass or copper, iron, of course, being unsuitable. It will be easily seen that the compass-box and telescope move round as one piece on an axis passing through the centre of the azimuthal circle. When an observation is made, the telescope is pointed to a star whose position with regard to the astronomical meridian is known at the time of observation. The telescope with the compass-box is then brought the proper number of degrees on the azimuthal circle, until its axis is in the meridian of the place. If, when the telescope is in this position, the north end of the needle stand at the zero-point of the inner circle, the declination would be 0°; but if it lie east or west of this point, the declination is shewn by the degree at which the needle stands. It is difficult to construct a needle so that the line joining its poles exactly coincides with the line joining its visible extremities. If this coincidence be not perfect, the geometrical axis of the needle according to which the reading is made lies to the right or left of the magnetic axis, and consequently of the true reading. To remedy this, the needle is so made that it can rest either on its lower or upper surface. In finding the true reading, the position of the needle is marked, and then it is turned upside down, and again marked, the mean of the two readings giving the true one. This is easily seen in fig. 2. The declination of the needle may be also ascertained by the 'Dipping Needle' (q. v.). The ordinary compass which must be used by making allowance for declination, is a declination compass. See MAGNETISM, TERRESTRIAL.

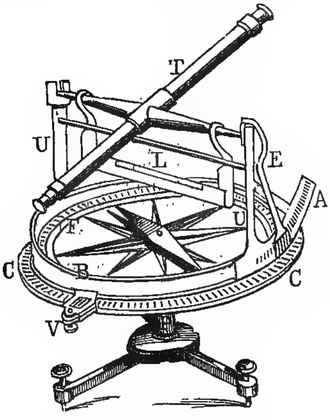


Fig. 3.

**DECLINA′TURE**, in Scotch Law, a preliminary plea declining the jurisdiction of the judge, either on the ground of his being interested in the suit, or of the case being beyond his province. In England, it is spoken of as a plea to the jurisdiction on the ground of interest, &c.

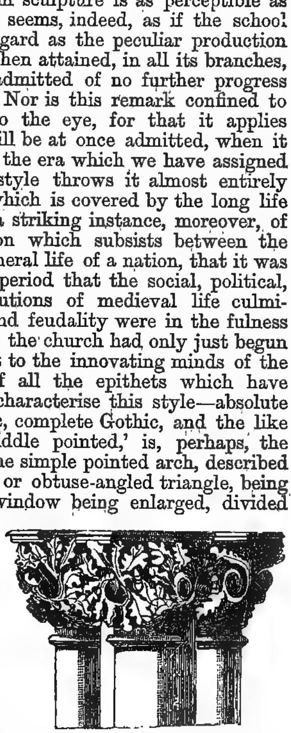
**DECO′CTION** is the term applied in pharmacy to the solution procured by boiling an organic substance with water.

**DECOLORI′METER** is an instrument for determining the power of portions of bone-black or animal charcoal to abstract colouring matter. See BONE-BLACK.

**DECOMPOSI′TION** is a term employed in chemistry to signify the separation of more simple substances from a compound. Thus, when the red oxide of mercury ($HgO$) is heated, it suffers D., and is resolved into mercury ($Hg$) and oxygen ($O$); and water ($HO$), when subjected to a current of voltaic electricity, is decomposed into hydrogen ($H$) and oxygen ($O$).

**DECOMPOSITION OF FORCES.** See COMPOSITION.

**DE′CORATED STYLE** of Gothic Architecture. During the reigns of the first three Edwards, from the latter part of the 13th till nearly the end of the 14th c., Gothic architecture may be said to have been in full bloom in England. It attained perfection somewhat earlier in France and Germany, and somewhat later in Scotland, and consequently the buildings on the continent which correspond to what is called the D. S. in England, belong, for the most part, to the beginning, and those in Scotland, for the most part, to the end of the 14th century. The decorated style arose so gradually out of the style which preceded it, and merged so gradually into that which followed it, that it is not wonderful that different periods of duration should be assigned to it by different writers. The longest, probably, is that mentioned by Britton, from 1272 to 1461; and the shortest by Rickman, from 1307 to 1392. In fixing on the middle of the 14th c. as its highest point, however, they are all pretty much agreed, and the same agreement is exhibited in recognising it as the most perfect of the Gothic styles. The decorated was a higher development of the early English style, all the peculiarities of which, both in its forms and in its adornments, it exhibited in greater perfection and richness; and it is remarkable that when we pass from it to the more elaborately florid style which succeeded it, the degeneracy in sculpture is as perceptible as in architecture. It seems, indeed, as if the school of art which we regard as the peculiar production of the middle age, then attained, in all its branches, to a point which admitted of no further progress in that direction. Nor is this remark confined to art, as addressed to the eye, for that it applies equally to poetry will be at once admitted, when it is remembered that the era which we have assigned to the decorated style throws it almost entirely within the period which is covered by the long life of Chaucer. It is a striking instance, moreover, of the intimate relation which subsists between the æsthetic and the general life of a nation, that it was at this very same period that the social, political, and religious institutions of medieval life culminated. Chivalry and feudality were in the fulness of their vigour, and the church had only just begun to give employment to the innovating minds of the first reformers. Of all the epithets which have been employed to characterise this style—absolute Gothic, pure Gothic, complete Gothic, and the like—that of the 'middle pointed,' is, perhaps, the most descriptive; the simple pointed arch, described from an equilateral or obtuse-angled triangle, being retained, but the window being enlarged, divided by mullions into several lights, and the heads filled with tracery. Of this, as of all the other styles of architecture, the most characteristic feature of all is unquestionably the capitals of the pillars. Of the foliage which is employed in the decorated capital, Mr Bloxam remarks, that it 'may generally be distinguished from that of the early English by its not rising from the neck moulding



Decorated English Capital: York Cathedral.

with stiff stems, but being carried round the bell in something of a wreath-like form. . . . . It often exhibits much of natural freedom; and we frequently find the oak, the ivy, the hazel, the vine, the fern, &c., very beautifully and closely copied from the natural leaves.

**DECOUPLÉ**, or **UNCOUPLED**, in Heraldry, is severed or disjoined, so that the ends stand at a distance from one another, as a *chevron decouplé*.

**DECOY'ING OF CHIL'DREN.** The crime of stealing human creatures, the *plagium* of the Roman law and of the law of Scotland, is severely punished by the legislation of every civilised country. In countries where slavery does not exist, the theft of a human adult is a crime which can scarcely occur. Where a free man is wrongously captured or detained, the crime is not theft, but wrongous imprisonment, which will be dealt with by the criminal law as an injury to the public, while at the same time the individual will be entitled to recover damages for the injury which he has personally sustained. Formerly, it was regarded as treason to the king, inasmuch as it was a wrongful detaining of his free liegeman without his licence or commission, and as such was punishable with death, both in England and Scotland (Hume's *Com.* i. p. 83). The only form in which the crime has been dealt with in modern times is that of child-stealing, for which sentence of death was pronounced in Scotland so lately as 1817; but the libel is now invariably restricted, in which case sentence of transportation has usually been pronounced. In England, the offence is statutory, it being enacted by 9 Geo. IV. c. 31, s. 24, 'That if any one shall maliciously, either by force or fraud, lead or take away, or decoy or entice away, or detain any child under the age of ten years, with intent to deprive the parent or parents, or any person having the lawful care of such child, of its custody, or to steal any article upon or about its person; or if any person shall receive or harbour such child for such purposes, every such offender shall be guilty of felony, and liable to be transported for seven, or to be imprisoned for two years; and if a male, to be thrice whipped.' The act does not apply to any person who shall have claimed to be the father of an illegitimate child.

**DECREE'**, in Theology. See PREDESTINATION.

**DECREE**, or, as it is frequently called in Scotland, a Decreet, is a final judgment of a court, whereby the question at issue is set at rest. In England, it is more commonly applied to the final judgments of courts of equity.

**DECREE IN ABSENCE**, in Scotland, is equivalent to a judgment by default in a common law court, or a decree *pro confesso* in Chancery.

**DE'CREMENT, DECRE'SCENT**, and **DECOURS**, are heraldic terms by which the wane of the moon is indicated. A *moon decrescent*, is a half-moon with her horns turned to the sinister.

**DECREPITA'TION** is the term applied to the crackling sound heard when a substance like common salt is thrown upon a fire. A series of minute explosions occur, owing to the water between the plates of the crystalline particles becoming expanded by the heat, and ultimately bursting them.

**DECRESCE'NDO**, in Music, is the reverse of crescendo—viz., a gradual diminishing of the sound. The executing of the decrescendo is very difficult, whether on one or more notes. Like the crescendo, it is also frequently combined with a slight ritardando, especially in descending passages. It is frequently marked thus >

**DECRE'TALS.** The body of the canon law consists, 1st, of the Decretalium, a collection made by Gratian, a Benedictine monk, after the middle of the 12th c., in imitation of the Roman Pandects, and drawn from the opinions of the Fathers, popes, and church-councils; 2d, of the Decretalia, collected by Pope Gregory IX., nearly a century later, from the decretal rescripts or epistles of the popes, as the code of Justinian was from the constitutions of the emperors. To these, additions were made by several succeeding popes. See CANON LAW.

**DEDU'CTION** is a particular kind of reasoning or inference. In ordinary language, to deduce means to trace one thing to another as its cause, to shew that one proposition follows from some other proposition or propositions. In logic, its signification is more definite. It is usual to oppose Deduction to Induction (q.v.), and to say that the latter consists in reasoning from particulars to generals, the former in reasoning from generals to particulars. In fact, however, every step in a deduction is also an induction. The several steps of a train of deductive reasoning consist of Syllogisms (q. v.), and the major proposition of a syllogism is an induction, or a general proposition expressing the result of a previous induction. The whole object of this kind of reasoning is to shew that some particular case or phenomenon really has the marks which bring it under the class to which the general proposition was meant to apply. Thus, the equality of the angles at the base of an isosceles triangle is deduced from the general proposition, 'That magnitudes which can be applied to one another so as to coincide are equal,' by shewing that the angles in question can be so applied.

Deduction is more properly opposed to Experiment. Suppose the question to be as to the relation between the spaces and times in falling bodies, the point may be determined in two ways. We may institute experiments, and observe how far bodies *do* fall in different times, and conclude a general proposition from the particular instances we observed; or we may bring the case under two general principles already established, those, namely, expressed in the first law of motion, and in the nature of gravity as a moving force, and calculate from these how far bodies *will* or *must* fall in given times. The conclusion or law arrived at in both cases is the same; but in the one case it is experimental, in the other deductive. It is the tendency of all sciences to become more and more deductive. Knowledge put on a deductive basis is sometimes spoken of as science, *par excellence*, and the immediate results of observation as empiricism. Mathematics is essentially a deductive science, and most of the truths in natural philosophy have been gradually put on similar grounds. Chemistry remains almost wholly experimental; it can predict or deduce little or nothing regarding an untried case, except, perhaps, the proportion in which two bodies will combine. See REASONING.

**DEE**, the name of two rivers in Scotland. The larger and more important rises in five wells 4000 feet above the sea, near the top of Braeriach Mountain, in the neighbourhood of Cairntoul and Ben Macdhui, 25 miles north-west of Castleton of Braemar. After flowing 12 miles south-south-east, it joins the Geauley, at the height of 1294 feet above the sea. It then tumbles through a narrow chasm in the gneiss rock, called the Linn of Dee, across which a person can leap. After this it runs east-north-east through Aberdeenshire and a small part of Kincardineshire, and ends in the German Ocean at the harbour of Aberdeen. In this course, 96 miles in all, it receives a number of tributaries—the

Lui, Muic, Feugh, &c. The basin of the Dee, which is about 1000 square miles in area, consists of granite and gneiss in nearly equal areas. In the gneiss occur many beds of primitive limestone, and some masses of trap-rock and serpentine. On the Dee are Balmoral Castle and several villages much resorted to in summer—Castleton of Braemar, Ballater, Aboyne, Kincardine O'Neil, Banchory-Ternan, and Cults. The soil on the Dee is light and sandy, and requires much rain. A railway extends up Deeside for 32 miles, from Aberdeen to Aboyne. See Balmoral and Braemar.—The smaller Dee rises in Kirkcudbrightshire, near the northern boundary of that county. Its general direction for the first 40 miles is south-easterly, after which it flows west to the Solway Firth, into which it falls at Kirkcudbright Bay. The D. divides Kirkcudbright into two nearly equal portions, and near the centre of the county it expands to about the average breadth of a quarter of a mile, preserving this appearance for about 10 miles of its course, and forming successively Loch Ken, Loch Dee, and Long Loch. It is about 50 miles in length, and is navigable for the last 7 miles. The waters of the D. are noted for their salmon, which are of a darker hue, and are fatter than those of most rivers in the south of Scotland.

**DEE**, a river in England, draining parts of the shires of Merioneth, Denbigh, Flint, and Salop, in Wales, and the west of Cheshire. Near Trevor, it is crossed by the Ellesmere Canal, on an aqueduct 1007 feet long and 120 high; and also by the stone viaduct of the Chester and Shrewsbury Railway, of 19 arches, each 90 feet span, and 150 feet high. Below Trevor, the D. winds first south-east, and then north-east, and north to Chester, which city it nearly encircles. At Chester, it is 100 yards broad, and runs alongside marshes in an artificial tidal canal 9 miles long, and admitting ships of 600 tons. It ends in the Irish Sea, in a tidal estuary 9 miles long and 3 to 6 miles broad, and forming at high water a noble arm of the sea; but at low water a dreary waste of sand and ooze, with the river flowing through it in a narrow stream. Its whole course is 80 miles long, and its chief tributaries are the Treveryn, Alwen, Ceirog, Clyweddog, and Alyn. Its upper basin chiefly consists of Silurian strata, and its lower of new red sandstone. Canals connect the D. with the rivers of Central England. The ancient Britons held its waters sacred.

**DEE**, John, a celebrated astrologer and mathematician, was the son of Rowland Dee, 'gentleman-sewer' to Henry VIII., born in London 13th July 1527, and educated at St John's College, Cambridge. After residing for some time at the university of Louvain, he went in 1550 to Paris, where, at the College of Rheims, he read lectures on the *Elements* of Euclid with very great success. In 1551, he returned to England, was presented by Cecil to Edward VI., and pensioned; but during the reign of the 'Bloody Mary' he nearly lost his life. He again set out for the continent in 1564, ostensibly for the purpose of presenting to the Emperor Maximilian a book which he had previously dedicated to him. Lilly, however, in his *Memoirs* (p. 224), affirms that he acted as Queen Elizabeth's 'intelligencer' or spy, and this theory is probably the true one. Lilly says that he was 'a ready-witted man, quick of apprehension . . . . and excellent in all kinds of learning;' while the professional mask which he wore, the pretensions he made of being able to raise and converse with spirits, served to prevent all suspicion.

The impression that Dee had dealings with the devil, seems to have become more prevalent the longer he lived. In 1576, a mob assembled around Mortlake, his country residence, and, attacking the house, broke his instruments, and destroyed his library, which was large and costly, Dee and his family escaping with difficulty.

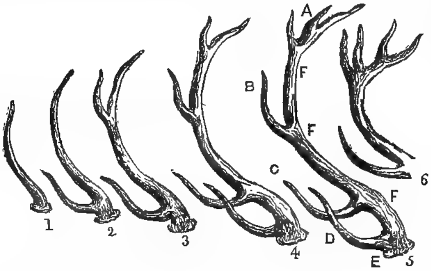
In the year 1581, having taken into his service an apothecary of the name of Kelly as assistant, Dee visited various continental courts, pretending to be able to raise spirits. Whether he took to this strange profession through a sincere belief in what he professed, or adopted it merely as a blind, a pretext for visiting foreign courts at which he had more serious business to transact, it is impossible to say. In 1595, he was appointed warden of Manchester College, where he resided nine years, and whence he returned to Mortlake. His death took place in 1608, in the 81st year of his age. He died very poor. Dee's writings are very numerous; they are chiefly scientific treatises, and many of them are still in manuscript in the Cottonian and other collections. In 1842, the Cambridge Society published the Private Diary of Dr John Dee, with a catalogue of his library of scientific MSS. made by himself.

**DEED**, in Law, is a formal written expression of something done by the party or parties from whom it proceeds. The term is applied to almost every form of legal writing, and will consequently be treated under various heads. See Indenture, Charter, Testament, Disposition. As to the manner in which deeds are executed in England, see Signing, Sealing, and Delivering; and in Scotland, see Testing, Witness, Delivery, Holograph, Registration.

**DEE'MSTER, DEMPSTER**, or **DOOMSTER**, the name of an officer formerly attached to the High Court of Justiciary in Scotland, who pronounced the doom or sentence of condemned persons. The office was held along with that of executioner. At the conclusion of a trial, this dread official was produced in open court, in presence of the wretched criminal, as is graphically described by Scott in his tale of *Old Mortality*. See notes to that work, and also notes to *Heart of Mid-Lothian*. The office of deemster has been long abolished. In the Isle of Man (q. v.) and Jersey (q. v.), Deemsters are a kind of judges.

**DEER** (Ger. *thier*, meaning 'beast'—a sense which the Eng. *deer* once had; Gr. *thēr*, Lat. *fera*), a Linnæan genus of ruminant quadrupeds, now constituting the family *Cervidæ*, which some naturalists have divided into a number of genera, whilst others still regard it as forming only one, the distinctions between its groups not seeming to them sufficiently marked or important for generic characters. Deer are animals of graceful form, combining much compactness and strength with slenderness of limb and fleetness. They use their powerful horns for weapons of defence, and sometimes of offence; but in general they trust to flight for their safety. They have a long neck, a small head, which they carry high, large ears, and large full eyes. In most of them there is, below each eye, a sac or fold of the skin, sometimes very small, sometimes of considerable size, called the *suborbital sinus*, *lachrymal sinus*, or *tear-pit*, the use of which is not well known. Deer have no cutting teeth in the upper, but eight in the lower jaw; the males have usually two short canines in the upper, but neither sex has any in the lower jaw; the præmolars are three, and the true molars three on each side in each jaw. They are distinguished from all other ruminants by their branching horns (antlers), which in most of the species exist in the male sex only; they are solid and deciduous, i. e., fall off annually, and are renewed with increase of size, and of breadth of palmation, and number of branches, according to the kind, until the animal has reached old age, when the size of the horns begins to diminish on each annual renewal. The size and development of the horns are indeed closely connected with the sexual system, and their annual renewal takes place just in time for the rutting season, when they are much used in fierce combats. Females with diseased ovaries sometimes exhibit horns like those of the male.

The annexed cut represents the horns of the stag at different ages. During the first year, there is only a slight protuberance; the second year is marked by the *brow antler* (1); the third year, by the *bay antler* (2); the fourth, by the *tray antler* (3); the fifth, by the *crockets* (4); the sixth, by the *beam antler* (5), the various parts of which are termed (A) *crockets*, (B) *tray*, (C) *bay*, (D) *brow*, (E) *pearls*, (F) the *beam of the antler;* seventh year (6).



The horn of a deer is a continuation of bone from the outer table of the skull, and is at first clothed with a velvet-like covering (the '*velvet*'), continuous with the outer integuments of the head, which, however, is soon rubbed off—the animal appearing to be impelled by some irritation to rub it against trees or rocks—leaving the horn hard and solid, with traces of the course of the many vessels which were employed for its production. The growth of the horn is very rapid. When the old horn has been cast, there is a wound which bleeds a little, but is soon skinned over with a fine film, and the new horn almost immediately begins to sprout. Cast-horns are very rarely found in deer-forests, a circumstance that has never been quite satisfactorily accounted for. The growth of the horn is attended with much heat, and the blood-vessels which supply the head enlarge in size. The last part of the process is the formation of a rough circle of bony tubercles (the *burr* or *pearl*) at the base of the horn, bearing some proportion to the size of the horn and the age of the animal. It is by these, as they enlarge, that the nutritive vessels of the 'velvet' are compressed and obliterated.—Deer are pretty uniformly clothed with hair, longer and thicker in those which inhabit cold, than in those which inhabit warm climates. The tail of all the species is short. The horns of some are broadly palmated, those of others are rounded; and importance has been attached in classification to their having or wanting a distinct *snag* or short branch projecting in front from the base of the antler; which is present, for example, in the stag, fallow-deer, reindeer, and axis, and wanting in the roebuck, elk, and cariacou. The broad palmation of the horns of species inhabiting the coldest climates has been supposed to be intended for turning over the snow in search of food. One of the most beautiful adaptations in nature is a peculiarity of the foot of the reindeer, by which the hoofs separate to a remarkable width, and the greater extent of surface prevents the foot from sinking in soft snow. Deer are found in almost all parts of the globe except Australia and the south of Africa, their place in the latter region being supplied by antelopes in extraordinary number and variety. Some of them live amidst the snows of very northerly regions, and some in tropical forests; the greater number inhabit the warmer temperate countries, and they are chiefly found in wide plains and hills of moderate height, none dwelling on those lofty mountain summits which are the chosen abode of some animals of the kindred families of *Antilopidæ*, *Capridæ*, and *Moschidæ*, as the chamois, the bouquetin, and the musk. The flesh (venison) of most kinds of deer is highly esteemed for the table, and they have long been regarded as among the noblest objects of the chase. Only one species, the reindeer, can be said to have been fully domesticated and reduced to the service of man; although individuals of many species have been rendered very tame.

See Axis, Cariacou, Elk, Fallow-deer, Muntjak, Reindeer, Rusa, Stag, Wapiti, &c.—The Musk (q. v.), although sometimes called Musk-deer, is not of the deer family.

**DEER, or DEIR, Old,** a village and parish in the north-east of Aberdeenshire, in the district of Buchan. Here are vestiges of a Cistercian monastery founded about the year 1219, by William Cumyn, Earl of Buchan, on the site of a church believed to have been planted by St Columba, and his disciple St Drostan, about the year 580. A few MSS. which had belonged to the monks of Deir, found their way, after the Reformation, to the University Library at Cambridge; and among them one has been recently discovered, which has come to be known among archæologists and philologists as the *Book of Deir.* It contains a copy of the gospels (in the Latin version of St Jerome) and of the Apostles' Creed, in the handwriting of the 9th c., with a portion of a *Missa de Infirmis*, or 'Communion of the Sick' (containing a Celtic or Gaelic rubric), in a later hand. On the blank leaves at the beginning, in the handwriting of the early part of the 12th c., are a few notes or memorials, in the Celtic or Gaelic language, recording 'How Columcille and Drostan came from Hi to Aberdour, and how Bede the Pict, who was then Maormohr of Buchan, gave them the towns of Aberdour and Deir,' and how succeeding maormohrs, chiefs of clans, kings, and others, added to the immunities and endowments of the church of Deir. These notes or memorials are of great philological interest, as the only known examples of the Celtic speech of Scotland in the 12th century. They are also of great historical interest, as opening up glimpses of the social state of the country during the obscure period between the 7th and 12th centuries. The *Book of Deir* is to be edited for the Spalding Club, by Mr Bradshaw of King's College, Cambridge, to whom the world of letters owes its discovery.

**DEERMOUSE, or JUMPING MOUSE** (*Meriones*), a genus of American rodent quadrupeds allied to mice and to jerboas, and differing from the gerbils of the warm parts of the Old World only in the greater length of their hind-legs, the nakedness of the tail, and the existence of a very small tooth in front of the molars of the upper jaw. The D. or Jumping Mouse of Canada (*M. Canadensis*), common in that country, and often seen in summer and autumn, is a beautiful agile little creature, of the size of a mouse, with a very long tail, and very long slender hind-legs. It is capable of taking leaps of four or five yards. It burrows, and passes the winter in a state of lethargy.—Another species, the Labrador Jumping Mouse (*M. Labradoricus*), inhabits the still more northerly parts of North America.

**DEER-STALKING** is the art of following the red deer by cautious manœuvring, for the purpose of shooting it with the rifle; and as practised in the Highlands of Scotland, is perhaps unequalled as a sport in fatigue as well as in excitement. The extensive tracts of hill-land over which deer roam, and on which they are stalked, are termed 'deer-forests,' few of which, however, notwithstanding the appellation, can boast of a single tree; and where these 'forests' belong to noblemen and others peculiarly addicted to the sport, deer are strictly preserved, to the almost total exclusion of sheep and cattle. This sport is more highly esteemed, and greater sums are paid for it by its devotees than for any other in Scotland. This arises chiefly from two causes: 1st, from the intense excitement occasioned in the pursuit of the red deer; and 2d, from the comparative scarceness of good forests. Deer-stalking demands many expensive accessories, among which may be mentioned—deer-hounds, to pursue and bring to bay wounded game; one or more guides to accompany the stalker; and hill-men to *drive* the deer, when that method of obtaining shots is determined upon, &c. However excellent a marksman the deer-stalker may be, and though he may be tolerably conversant with the general 'lie' and bearings of the ground, he is almost always accompanied by an experienced guide, upon whose cool judgment, keen eye, and thorough knowledge of every knoll and rock of the 'forest,' depends greatly his chance of obtaining a shot. A dress resembling in colour as nearly as possible that of the ground to be gone over; a rifle of first-rate make, and previously practised with at various distances; a deer-hound or more, that watch constantly in perfect silence for the slightest look or sign from their master; a robust constitution, to stand the fatigue of walking, crouching (sometimes in water), crawling, or advancing on the back, feet first, are some of the absolute requisites the deer-stalker must possess. And when we add to these the most unflinching perseverance and untiring patience, we have not said all, for unless he is gifted by nature or experience with *nerve* to take instant and careful advantage of the rare opportunities a day's stalk may offer, his previous care and toil must go for nothing. The rutting season commences in October, when the harts are of course useless, but yeld or barren hinds may be shot, and are in good condition. This sport depends more upon the vicissitudes of wind and weather than perhaps any other. Deer are gifted with very keen scent, a fact of which the stalker is well aware, and for which he must allow by advancing upon his game *up* the wind. They are also far-sighted, and exceedingly prone to take alarm at the slightest sound, faculties which warn the stalker never to let himself or his attendant be seen, and to observe the strictest silence. Deer, if disturbed, for the most part look for the cause as proceeding from the *low grounds*, and rarely from above; this peculiarity is duly taken advantage of by the sportsman, who accordingly advances upon his game, wind permitting (frequently by the most circuitous and precipitous paths), *down* hill. When thus approaching deer that are feeding in the valley below, the utmost caution is requisite, both as regards speed and the mode of progression. The stalker must advance inch by inch on his back, by resting himself on his elbows, and drawing himself forward by his heels; he must observe every motion of the deer, stopping when they stop feeding, and retaining his position, irksome though it be, till his game recommence pasturing; he must never, even for an instant, display the slightest unusual motion during his toilsome and stealthy advance, and must submit implicitly to every signal and whisper from his guide. During protracted stalks, especially when the nature of the ground between man and deer is free from sheltering knolls, the stalker's patience is tried to the utmost by his having to pause so frequently in his progress; the stalk, however, is usually directed not so much *directly* towards the deer, as for some intervening knoll or rock where a little relaxation of limb and breathing-time may be obtained, ere firing. Thus, if fortunate in properly winding the deer, and if the stalk has been successfully accomplished, the herd may be reached within 50 or 100 yards. The game may possibly consist of either a single stag, or some hinds and one or two stags; the finest of the latter is usually the aim of the true stalker, and the most deadly spot to aim at is behind the shoulder. If mortally hit, the animal frequently bounds away for twenty or more yards, and then falls dead; if not mortally struck, it will sometimes fall at the shot, and spring up again, and follow the retreating herd. It is then the deer-hound is slipped. When a deer is killed, and cannot be immediately conveyed home, the attendant instantly disembowels it, that the venison may not be tainted. This operation is termed *gralloching*. The best stag in the herd is that which is the fattest, and has the finest antlers. See DEER. When there are more than one sportsman, or where the peculiarities of the ground are such as to render the task of stalking unusually difficult, hill-men are employed to drive the deer towards certain passes, behind which the shooters are previously concealed. On such occasions, the excitement produced by the gradually approaching and unsuspecting herd, mingled with the grandeur of the whole scene, as they at length rush through the fatal pass, is enough to try the nerves even of the most experienced stalkers. The Black Mount, belonging to the Marquis of Breadalbane, is the finest deer-forest in Scotland, and extends for upwards of twenty miles. The best work we know of on the subject of deer-stalking is Scrope's treatise, published in 1838; 3d edit. 1847.

**DEE'R-STEA'LING.** By 7 and 8 Geo. IV. c. 29, s. 26, it is enacted that any person who shall unlawfully hunt, snare, or carry away, kill or wound any deer kept in the enclosed part of a park, chase, or other enclosure, shall be guilty of felony, and shall be liable to be punished in the same manner as in the case of simple larceny. If the deer be in the unenclosed portion of the park, the punishment is a fine not exceeding £50, which the justice may modify as he shall see fit. The second offence, in every case, is to be considered felony. Suspected persons found in possession of venison, or of the head or skin of a deer, or of snares or engines for taking deer; who shall not be able to satisfy the justice that they came lawfully by the venison, or had a lawful occasion for the snare, may be fined a sum not exceeding £20. A like penalty is imposed (s. 28) for setting engines for taking deer and pulling down park-fences. By s. 29, deer-keepers and their assistants may seize the guns, snares, dogs, &c., of offenders who do not deliver them up on demand, and resistance on their part is declared to be felony. In Scotland, the offence of breaking into a deer-park and shooting deer is punishable as theft. Shooting a stray deer without the owner's consent, is punishable by fine. Though not entitled to kill deer trespassing on his property, the proprietor may drive them off (Stair, ii. 3, 68; Ersk. ii. 6, 14); and one of two co-proprietors may drive off deer against the will of another. (Irvine, *Game-laws*, p. 13.) There is no reference to deer in any of the acts which regulate the duty on game certificates, and persons shooting them would not be liable to the penalties imposed by these statutes, nor are they alluded to in either of the two more recent acts against poaching by night or day (ib.).

**DEFAMA'TION.** See LIBEL.

**DEFAU'LT,** JUDGMENT BY. Where the defendant in a cause has failed to make appearance or to lodge a sufficient plea, or other pleading, in due time the plaintiff may proceed to sign judgment by default. Where a writ of summons has been specially endorsed (q. v.), the plaintiff, on lodging an affidavit (q. v.) of the service of the writ, may immediately sign judgment by default, and in eight days from the last day for appearance, execution may issue against the defendant. If the writ of summons have not been specially endorsed, the plaintiff must file, at the office of the Master (q. v.) of the court, a Declaration (q. v.) endorsed with a notice to plead in eight days, and at the expiry of that time may, if there be no appearance, sign judgment by default. Judgment by default, for want of a plea, &c., may in like manner be signed on failure of the defendant to deliver a sufficient plea in the prescribed time. Judgment by default is not necessarily final. In case of non-appearance, it will be set aside on the defendant making affidavit as to the cause of non-appearance, and disclosing a ground of defence on the merits. If judgment have been for want of a plea, &c., it may also in general be set aside on an affidavit of merits. But in both cases, the defendant must suffer the costs of the proceedings.

**DEFEA'SANCE,** DEED OF (in English law). An instrument which defeats the force or operation of some other deed or estate; and that which in the same deed is called a condition, in a separate deed is called a defeasance. Defeasance is of two sorts, one applicable to freehold estates, the other to terms of years and other executory interests.—*Bythewood.* Defeasance of the freehold is a collateral deed made at the same time with a feoffment (q. v.), or other conveyance, containing certain conditions, upon the performance of which the estate thus created may be defeated or totally undone.—Stephen's *Commentaries.* This deed owes its origin to the restrictions on the conveyance of land imposed by the feudal law. Under that system, every tenant of land was, by virtue of his tenancy, vassal under a superior lord, to whom he owed suit and service. The consent of the lord was necessary for every change of vassal; and the law would not recognise a condition whereby, in a particular event, the land should revert to the original tenant, and the over-lord be thus forced to change his vassal. Hence, when a holder of land wished to obtain money on the security of his land, the conveyance to the lender was *ex facie* absolute; but a deed of defeasance was executed, in virtue of which the borrower, on payment of his money, could recover his land. In this manner mortgages were originally effected. In process of time, the practice of inserting conditions in the original conveyance became established, and from that period, deeds of defeasance have ceased to be in general use. Lord Talbot, in the case of Cotterel *v.* Purchase (Ca. tem. Talbot 61), said he should always discourage the practice of drawing absolute deeds, and making a defeasance which wore the face of fraud.*

Defeasance of executory interests may be made at any time after the creation of the estate to which it refers. It must be made with the same formalities as those which created the estate, and between the same parties or their representatives.

**DEFE'NDER OF THE FAITH,** a title conferred on Henry VIII. by Pope Leo X., as a reward for writing against Martin Luther, in 1521. When the king afterwards suppressed the religious houses at the Reformation, the pope not only recalled the title, but deposed him. The title was afterwards confirmed by parliament (35 Henry VIII. c. 3), and has ever since been used by the sovereigns of this country. The corresponding title in Spain is, Most Catholic, and in France was, Most Christian King.

**DE'FERENT,** an old term in Astronomy, signifying a circle on which the centre of another circle moves, while a body is supposed to be moving on the latter itself. If we suppose the sun to be moving round a centre in space, while the earth moves, say, in a circle round the sun, then the sun is moving in the deferent. The term originated in the Ptolemaic System (q. v.).

**DEFI'CIENT NUMBERS.** A number is said to be deficient whose aliquot parts, or factors, added together make a sum less than the number itself: thus, 16, whose parts, 1, 2, 4, 8, make together only 15, is a deficient number.

**DEFILA'DING** is that part of the art of fortification which consists in determining the directions and heights of the lines of rampart, so that the interior may not be commanded by the fire of any works which the enemy may raise. Defilading is divided into horizontal and vertical. The object of the first is to prevent the lines being commanded in the direction of their length, or enfiladed; the prolongations of the lines, therefore, must avoid all points where hostile works could be erected. Vertical defilading determines the height of rampart necessary to protect the interior from direct fire.

**DEFI'LE,** in Military Language, is the name given to any passage which is of such a nature that it must be traversed by troops only in column with a narrow front. Wherever free lateral movement is obstructed, is a defile; and a defile is a 'pass' when it cannot be avoided, without making a long circuit.

**DE'FINITE PROPO'RTIONS,** LAWS OF, in Chemistry. See ATOMIC THEORY.

**DEFINI'TION** is the explanation or statement of the meaning of a word, viz., either the meaning it usually bears, or that which the speaker or writer, for the particular purposes of his discourse, intends to annex to it. To give merely another synonymous name—to say, for instance, that 'Man is a human being'—is not commonly considered a definition at all. Names requiring definition mostly imply, or connote, a set of attributes. To define such a name, then, is to enumerate all the attributes connoted by it. Hence, definition is a kind of analysis. If we were to define 'Man' as 'a rational animal,' the definition would be imperfect; for no one would call such beings as Swift's Houyhnhms men, which shews that, in the common acceptation of the word man, it connotes among other things a certain form. Definition, then, is of the nature of essential propositions; it conveys no information about the object to any one who is aware of the connotation of its name; it is only a statement of all the attributes, the absence of any one of which would make the object cease to be called by that name.

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* The mode of conveying land in security in Scotland was formerly almost identical with that which in England was effected by a defeasance. The Scotch deed was called the absolute disposition with a back bond. See WADSET, DISPOSITION, Abs. with back bond.

The definition, 'Man is a rational animal,' though incomplete, is correct so far as it goes; though it does not enumerate all the essential attributes—i. e., all the attributes connoted by the name man, yet those it does enumerate are connoted by the name, and are sufficient to mark out its denotation—that is, to distinguish all the beings known to exist to whom it can properly be applied. Such is generally held, therefore, to be a complete definition, though logically imperfect; but to say that 'Man is a featherless biped,' involves a different kind of imperfection. The attribute featherless, though actually true of all men, and therefore serving to distinguish them from the only other bipeds, the birds, is no part of the meaning of the word, but is what logicians call an *accidental* attribute. This kind of imperfect definition is called a description. Such definitions are very common in science, and serve special purposes of classification. In Cuvier's *Animal Kingdom*, man is defined or described as 'a mammiferous animal having two hands.'

A distinction is generally drawn between definitions of names and definitions of things, or *nominal* and *real* definitions. A real definition is intended, it is said, 'to explain and unfold the nature of the thing.' In objection to this view, it is replied, that no definition can unfold the whole nature of a thing, and every true proposition respecting it unfolds some part of its nature: of all the propositions, then, unfolding its nature, how shall we distinguish those that define it from the others? This question has never been answered. The fact seems to be, that 'all definitions are definitions of names, and of names only,' but that many expressions that pass for definitions, are something more. They not only define the name of the thing, but they comprise a tacit assumption, that a thing with such attributes does or may exist. This is the case with the definitions of geometry; and it is from these tacit postulates that the consequences are deduced, and not from the mere definition of the meaning of a word.

As there can be no accurate discussion unless all the terms employed have a distinct meaning recognised by all parties, it is often necessary to have recourse to formal definitions of important names. One of the most effectual devices ever yet discovered for settling the signification of terms, is to declare the meaning *opposed* to what is intended; in this way any ambiguity in the language is at once done away with. Thus, the word 'natural' conveys no clear meaning of itself; but if we state what we mean to *exclude* when we use it, we narrow the variety of significations to some one. We may oppose it to 'moral,' and then it means something connected with the world of matter; we may opposite it to 'constrained' or compelled, giving it the meaning of spontaneous or free; other contrasts are the 'artificial,' the 'distorted,' in copying or representing things, &c.

The scholastic logicians made definition consist in stating, first, the 'genus' that a thing belonged to, and, secondly, the 'difference' or peculiarities that separate it from all the other members of the same genus. This suits for natural history, and for all subjects analogous thereto. For example, if we were attempting to define 'Poetry,' we could not do better than proceed *per genus et differentiam.* Poetry belongs to the class of Fine Arts: it has all the characters common to Painting, Sculpture, Architecture, Music, &c. Consequently, if we are well acquainted with these other subjects, we can draw from them part of the characteristics that belong to Poetry; for example, its having for its end refined pleasure. We then inquire into the *difference* between it and the others, which we find to be the use of a peculiar medium or instrumentality—viz., thoughts expressed in language. If we would give a more particular account of the meaning, we should find it necessary to specify the *kinds* of poetry, or to find out the *differences* of epic, dramatic, lyric, &c.; which would be to define, not the subject itself, but its subordinate species. See J. S. Mill's *Logic*, vol. i. 182.

**DEFLAGRA'TION** is applied to the rapid combustion of ignited charcoal when a nitrate (such as nitrate of potash) or a chlorate (such as chlorate of potash) is thrown thereon. As chlorates do not occur naturally, it follows that deflagration with a natural salt indicates a nitrate; and if the deflagration be accompanied by a violet flame, it is characteristic of nitrate of potash (ordinary nitre or saltpetre); and if by a strong yellow flame, it is indicative of nitrate of soda (cubical nitre).

**DEFLE'CTION** is, generally, a change of course or line of motion of a moving body. The word deflection is also used as synonymous with Diffraction (q. v.).

**DEFLU'XION** (Lat. *defluxio*), a discharge from a mucous membrane, especially of the air-passages. It is synonymous with Catarrh (q. v.).

**DE FOE, DANIEL,** was born in London, 1661, and was the son of James Foe, a butcher. The prefix De was not added to the family name of Foe by our author until he had reached manhood. De F., whose father was a dissenter, was educated at a dissenting academy at Newington Green, where he remained until he had nearly reached the age of nineteen. In 1682, he began his career as author, publishing a pamphlet which contained strictures upon the clergy of that day. This was followed, in 1683, by another pamphlet, entitled *A Treatise against the Turks.* In 1685, he took part in the rebellion of the Duke of Monmouth, but luckily escaped being punished on its suppression. After this he engaged in trade, but a series of misfortunes finally determined him to forsake it.

In 1701, he published his famous satirical poem, *The True-born Englishman*, which was written in vindication of King William, and in answer to a poem in which he had been attacked, called *The Foreigners.* This poem proved a wonderful success; 80,000 pirated copies of it were sold on the streets at a trifling price. During the same year, when the deputation that presented the famous petition of the freeholders of Kent to the House of Commons were illegally thrown into prison, De F. drew up, a few days after, a remonstrance, known in history as the *Legion Memorial;* and is said to have himself, in the disguise of a woman, presented it to the Speaker as he entered the House. In 1703, a complaint being made in the House of Commons regarding one of his recent publications, called *The Shortest Way with Dissenters* (1702), the whole tenor of which seems to have been misunderstood, he was apprehended, tried, found guilty, pilloried, fined, and imprisoned. While in prison, he wrote a *Hymn to the Pillory;* and here also he projected *The Review*, a periodical which he established on his release in August 1704, and continued to conduct for nine years. In 1706, Lord Godolphin, who admired the practical talent and literary vigour of De F., employed him as one of the staff of the commissioners sent down to Scotland to bring about a union of the two countries. De F.'s knowledge of revenue, trade, and taxes, was found to be of great value; and it is supposed that he was rewarded with a pension for his services to government on that occasion. For some years after, De F. seems to have lived in comfortable circumstances, but gradually his numerous political enemies gathered voice again, and De F. was literally silenced by noise and obloquy; at last, however, roused by the insolence of the Jacobite party, he was once more tempted to write unwarily, and the result was that he was again (1713) apprehended, fined in £800, and committed to Newgate. After his release, De F. became sick of politics, and, fortunately for the world, sought rest in the sphere of imaginative literature. In 1719, appeared the famous *Robinson Crusoe*—the most popular of all his works. Its success was immediate. The publisher, who had accepted the book after all the others had refused it, is said to have cleared £1000 by its publication—no small sum in those days. De F., in rapid succession, produced his other notable works of fiction. *Moll Flanders* (1721), *Journal of the Plague* (1722), *Colonel Jack* (1721), *Adventures of Roxana* (1724), and the *Memoirs of a Cavalier*, the last of which Chatham used to recommend as the best account of the Civil Wars extant, bear witness to De F.'s industry during these years. He died in April 1731. D.'s style, both in his political and imaginative works, is simple, clear, and vigorous. His fictitious narratives are characterised by an unparalleled appearance of truth. This is pre-eminently the case in the *Journal of the Plague*, which for a long time imposed upon the well-known Dr Mead, who thought it genuine.

**DEFO'RCEMENT**, in English Law, is an ouster of the freehold (q. v.). It is the holding of any lands or tenements to which another person has right. In this sense, it includes as well an abatement, intrusion, disseisin, or discontinuance (q. v.), as any other species of wrong whatsoever, whereby he that hath right to the freehold is kept out of possession. But in its strict sense, it is only such a detainer of the freehold from him that hath the right of property, but never had any possession under that right, as falls within none of those injuries.—*Co. Litt.*, by Butler, 331 b. n. (1). The party thus wrongfully retaining possession was called the deforciant, and was said by Blackstone (2 *Comm.* 196) to have an *apparent right of possession.* There was this difference between a party retaining possession of the freehold by means of deforcement, and one who occupied by either of the other modes of ouster, that in the former case the party ousted had no right of entry (q. v.). This, previous to the reign of William IV., was a matter of some importance, inasmuch as the claimant was thereby debarred from recovering possession by means of entry or ejectment, and was driven to the more tedious process of asserting his right by a real action (q. v.). But by 3 and 4 Will. IV. c. 27, all real actions, except four, having been abolished, this distinction between deforcement and the other means of ouster has ceased to have the same practical importance.

**DEFO'RCIANT**, a title of the defendant in a suit for levying a fine of lands (q. v.).—The party wrongfully retaining possession of a freehold by Deforcement (q. v.).

**DEFO'RMITIES.** Varieties of form which mar the external appearance, may be *congenital* or *acquired*, according as they occur before or after birth. The former class were considered by the ancients to carry some important meaning in their mysterious shapes, and to shew the anger of the gods; hence, they termed them *monsters*, from *monstrare*, to shew; and even in later times, they were popularly believed to be the result of the most hideously unnatural combinations. Modern scientific writers have, however, made them a subject of special study, under the name Teratology (*teras*, monster, and *logos*, science), and their researches have shewn that deformities generally depend on some arrest of development of the fœtus, or some accidental position it has got into, or some inflammatory disease which has caused unnatural adhesion of parts. It has been found that in 3000 births in Paris, there occurs about one monster. They generally follow some definite law. Deformities are more common among domestic than wild animals, among mammalia than birds, and very rare among fishes and the invertebrata.

It is a common belief, that the mind of the female parent has an influence over the shape of her infant; but although some singular coincidences have occurred, there is no scientific proof that such is really the case. This theory, however absurd, was eagerly adopted in the middle ages; it was, in fact, often appealed to in the interest of mercy as a loophole of escape for pregnant women, who, by the barbarous ignorance of the time, might be condemned to torture; and so universal has the popular belief in this theory become, that even at the present day no scientific demonstration to the contrary has proved sufficient to undermine it. Deformities are, however, in many cases, hereditary, as may be seen in the instances of additional fingers and toes, and of hare-lips.

It seems uncertain whether the male or female parent chiefly influences the occurrence of deformity in the offspring. One rarely sees a case of hare-lip without being able to recognise a sort of tuck or shortening in the same feature of the mother; but the writer of this article knows a family of three with hare-lips, whose father alone is similarly deformed; and another family of three, with perfectly formed mouths, whose mother has an uncured and extremely unsightly hare-lip.

The chief congenital deformities may be classed under the following heads:

Deformity as regards *number* of parts; as, for instance, the Sirens, who have *apparently* but a single inferior extremity, which tapers to a point; the Cyclops, with but one eye; or the head itself may be absent, or some organ, as the brain. Such deformities, from a deficiency of parts, may also result from amputation of portions of the limbs of the fœtus when still within the uterus by the pressure of the umbilical cord. Curiously enough, however, it often happens that this intra-uterine amputation of parts leads indirectly to an exactly opposite condition—namely, a multiplication of parts arising from the stumps left by these uterine amputations; the fœtus in the early stages of its growth appearing to possess something of the power of reproduction of parts observed in most of the lower orders of animals. The parts most commonly reproduced are fingers and toes, or, most commonly of all, only abortive portions of these, as little projections from the stump of the limb, with traces of nail, and sometimes a single joint with an imperfect bony development. We see a new growth of little fingers or toes according to the member lost, and this power shews itself sometimes without being preceded by such an injury, in additional fingers, toes, &c. These parts are generally close to the similar natural ones, but not always, as, for instance, an ear in the neck.

Deformity with regard to *size*. This may involve the whole body, as in dwarfs, of whom there have been some remarkable peripatetic specimens: the Corsican fairy was only 2 feet 7½ inches high; Mademoiselle Crachami, the smallest lady who ever lived, died at 10 years of age, only 20 inches in height. This kind of deformity is not necessarily hereditary; the father of Borowlaski, who was only 39 inches when 30 years old, had six children alternately short and tall; and dwarf women have brought forth infants as long, when extended, as their mothers. One limb only may be diminutive. Of course, deformities the opposite of these exist, such as giants, or instances of premature or excessive local growth. O'Byrne, the Irish giant, measured 8 feet 4 inches when he died at the age of 22. Such individuals are generally subject to premature decay.

Deformity as regards *shape;* this results generally from retarded growth, the parts of the embryo not consolidating as growth advances, as in hare-lip; or from irregular muscular contractions, as in Club-feet (q. v.); or by two or more parts coalescing, as two fingers; or in Cyclopy, when both the eyes run into one.

Deformities of *colour* are frequently co-existent with tendency to, or the presence of, some disease. There may be deficiency of colouring matter, as in albinos; or an apparent increase, as in *blue disease,* arising from the partition between the right and left sides of the heart not being completed; or from some colouring matter produced in the body, as in the mottled individuals shewn in caravans.

Deformities of *continuity* occur from the lateral halves of the embryo not completely closing, as seen in clefts of the back, the palate, &c.

*Acquired Deformities* will be noticed under their special names.

**DEGERANDO**, Jos. Marie, Baron, author and philanthropist, was born 29th February 1772, at Lyon, France. His family was originally from Italy. He studied at the College of the Oratoire of Lyon with a view to becoming a priest; but the persecutions of the revolutionists altered his plans. In 1797, he went to Paris. The *coup-d'état* of the 18th Fructidor compelled him to flee to Germany, where he entered the army of Massena as a common soldier. While at Colmar with his regiment, D. wrote a treatise, which was 'crowned' by the Academy, and which was afterwards enlarged and published under the title of *Des Signes et de l'Art de penser, considérés dans leurs Rapports Mutuels* (Par. 1800). In 1802 appeared his *De la Génération des Connaissances Humaines,* a precursor of his *Histoire comparée des Systèmes de Philosophie relativement aux Principes des Connaissances Humaines* (Par. 1803; German, by *Tennemann*), which is reckoned the best French work on the History of Philosophy. It procured him, in the following year, admission into the Académie des Inscriptions et des Belles-lettres. About the same time, he was appointed Secretary-general to the Ministry of the Interior, and subsequently held a variety of high offices under Napoleon. But D. is even better known, and has done more service, by his philanthropic than his philosophic writings. To the former class belong his excellent work, *Le Visiteur du Pauvre* (Par. 1820), which obtained the Montyon Prize, as did also his *Du Perfectionnement Moral,* &c. (Par. 1824), his *Cours Normal des Instituteurs Primaires* (Par. 1832), *Institutions du Droit Administratif* (Par. 1835), *Education des Sourds-muets de Naissance* (Par. 1827), *Des Progrès de l'Industrie* (1841). D. was elevated to the peerage in 1837, and died 12th November 1842, Vice-president of the Council of State.—His son, A. Degerando, has written two interesting works—*Essai Historique sur l'Origine des Hongrois* (Par. 1841), and *Transylvanie et ses Habitants* (Par. 1845).

**DE'GGENDORF**, a town of Lower Bavaria, situated on the Danube, 29 miles north-west of Passau. It is well built, and has several churches. On the walls of one of these is a series of 24 paintings, detailing an ancient story of how certain miraculous wafers possessed by this church spouted forth blood on being pricked; and when cast into water, a radiant glory appeared on the surface. In 1489, Pope Innocent VIII. promised general absolution to all such as visited this church; and for a long time after, thousands of devotees annually journeyed thither. D. has manufactures of linen with some shipping-trade, also several mills. Pop. 3800.

**DEGLUTI'TION.** See Swallowing.

**DEGRA'DED**, in Heraldry, means placed upon steps or degrees, as in a *Cross Calvary.*

**DEGREE'**, in a College or University (Fr. *degré,* from Lat. *gradus,* a step), is a recognition of the student having made a certain step in advance, and having attained, as it were, to a certain resting-place in his academical career. The evidence of a degree is usually called a Diploma (q. v.). Degrees may be divided into various classes, according to the privileges which they confer. 1. They are either simple certificates of attainment granted by a competent authority; attesting either that the college or university granting them has ascertained the fact by examination—in which case they are ordinary degrees—or that the common fame of the individual is such that the learned body conferring the degree is willing to take it for granted, in which case they are honorary degrees. To this class belong our degrees in arts, and the honorary degrees of LL.D., D.C.L., and D.D., which are granted by most universities. 2. They are licences to teach the branch of knowledge with which the holder is certified to be acquainted. To this class belonged all doctors', and probably all masters' degrees in the universities of the middle ages. See Doctor. 3. They are licences to practise a certain profession or art. As the latter privilege is one in which the general community is more deeply interested than in either of the others, it is generally requisite to its full exercise that the university degree should be accompanied by a government licence. These latter degrees—of which the degree of M.D. and D.C.L. (see Doctors-commons) are the only ones known in this country—in this case resolve themselves into one or other of the former classes.

University degrees, like most institutions which have held their place in society long, arose out of public exigencies, and are not traceable to any single founder or to any single act. There is every reason to suppose that, substantially, they have existed for ages. The doctors or teachers of the law (*nomodidáskaloi*), so often mentioned in the New Testament—and probably the scribes also—were a class, taken, it would seem, very frequently from the sect of the Pharisees, but essentially distinct from them (Luke v. 17), possessing privileges very closely resembling those which were attached to the degree of a teaching doctor in after-times. In classical Greece, though far less formal than it afterwards became, education was probably more systematic than is commonly supposed. In the schools of Isocrates and Plato, Mr Kirkpatrick, in his ingenious book on the *Historically received Conception of the University,* has traced not only substantially the function, but much even of the external organisation of the university. He has shewn also, very clearly, that it was the systematic training which had become necessary for success in public life that called the Sophists into existence, and gave to them the marvellous social influence which they possessed. It was the ambition, not of the higher class of orators and statesmen alone, but of every noisy demagogue who aspired to notoriety, to come before the public with the prestige of having been the pupil of some famous Sophist, or, as we should say, of having been to a good school, and taken a good degree. All the appliances of modern teaching existed unquestionably in the Museum at Alexandria, and it is inconceivable that those who had passed through the *kuklos* or cycle of studies, should not have carried away some testimonial of proficiency very much resembling a degree. As there was a distribution both of teachers and students into what we should call the faculties of philosophy, philology, and medicine, it is probable, moreover, that there were distinct degrees corresponding to each of them. During the three centuries which intervened between Alexander and Augustus, Athens continued to be the great school of philosophy, as Rhodes was of oratory, and Alexandria of philology and medicine. The importance of an education in the Greek schools rather increased than diminished during the period of the Roman empire. So entirely, indeed, was the success of the young provincial in public life also dependent upon his literary acquirements, that, as Mr Kirkpatrick informs us, students, before leaving the provinces for Rome, were obliged to obtain a written permission from a magistrate, and that a record of the proficiency of each student was sent in to the government, in order that the latter might be thereby guided in the selection of fit individuals for the public service. In Constantinople, moreover, down to the very last, lifeless and unproductive though the intellectual life unquestionably was, it was formally organised to an extent which reminds one of China rather than of any existing European nation. The worthless and contemptible Byzantines, male and female, like the Chinese, passed endless examinations, and took abundance of degrees. After the incursion of the northern nations, the extreme rudeness of the general community of Western Europe caused the learned class to stand out from it with a prominence unknown in the society of antiquity, and hence the greater importance which academical degrees assumed in the middle ages. A man who had passed through the trivium or quadrivium at Constantinople before barbarism had made learning rare, or who had received the far higher instruction which was communicated at the museum of Alexandria, by no means differed from the society which surrounded him to the same extent as did a master or a doctor at Paris or Bologna. The minuter history of academical degrees in the middle ages is involved in much obscurity. The following are passages from the above-mentioned work of Mr Kirkpatrick, who has gone over the authorities with much care: 'Wood mentions (*Hist. and Antiq. of Oxford*, i. 50) that St John of Beverley (680 A. D.) was commonly reported to have been the first who took the degree of Master of Arts at Oxford. The same writer informs us, that this degree had become common in the reigns of John and Richard I. According to Bulæus (*Hist. Univ. Paris*, ii. pp. 256, 679, sqq.), academic degrees were first instituted at Bologna. The forms designative of the various orders of academic dignity in that university are stated to have been the Baccalaureatus, Licentiatus, and Doctoratus. Of these, the last two were probably equivalent to the degrees of the master incipient and the magister socius or regent of Paris. Certain stadia, or successive courses of legal study, are said to have been in existence from the time of Justinian. The five years devoted to the acquisition of juristic knowledge were divided into the Anni Justiniani, Edictales, Papinianistæ, Lytæ, and Prolytæ. The student who had passed through all successively was described as a licentiatus, from the circumstance that he was considered qualified to discharge the duties of an antecessor or public professor of this subject. The practice adopted in this respect by the schools of jurisprudence was afterwards transferred to theology at Paris by Peter Lombardus. The name Bachelor is supposed by Malden (*History of Universities and Academic Degrees*, p. 23) to have been borrowed from the terminology of the military hierarchy of those ages.' See BACHELOR. 'Bachelors are often styled scholars (Wood, *Hist. and Antiq. of Oxford*, i. p. 59), and the individual invested with this degree was regarded as, at the utmost, an imperfect graduate. At the same time, in accordance with the system of mutual instruction so thoroughly adopted in the schools of the middle ages, the more advanced class of scholars were both encouraged and commanded to perfect their own acquirements, and extend the educational influences of the university into the minutest ramifications of the system by teaching and catechising the junior members of their own body (Crevier, *Histoire de l'Université de Paris*, ii. p. 160). Bachelors, though thus intrusted with certain tutorial functions, never possessed any of the legislative powers assigned to the masters' (pp. 206, 207). It was to the teaching masters—and all who took the master's degree were bound to perform the duties of tuition for a time —that the term regent was applied both on the continent and in Scotland. On retiring from the office of regent, the master—at Paris, at least—ceased to take an active share either in the legislation or the government of the university (Bulæus, par. iii. p. 420). The question as to whether the institution of teaching masters or regents ought to be revived, to the extent of permitting them to compete on equal terms with the endowed professors, is one of the most important now under discussion amongst the university reformers of Scotland. A very excellent pamphlet in favour of it was published by Dr Kilgour of Aberdeen, in 1850. See BACHELOR, MASTER OF ARTS, DOCTOR, REGENT, UNIVERSITY.

**DEGREE**, in Music, is the difference of position or elevation of the notes on the lines and spaces. When notes are on the same line or space, they are on the same degree, even though one of the notes should be raised by a sharp, or lowered by a flat. When two notes follow diatonically, so that one of them is on a line, and the other on the space adjoining, the interval is of one degree. Subtracting one from an interval, gives the degrees which separate the two notes; thus, a third is separated by two degrees; a fourth, by three, &c.

**DEGREE.** See CIRCLE.

**DEGREE OF LATITUDE** is the space along the Meridian (q. v.) through which an observer must pass to alter his latitude by one degree—i. e., in order to see the same star one degree nearer to or further from the zenith. See LATITUDE. This space must be found by actual measurement; and owing to the earth being an oblate spheroid, and not a sphere, it varies with the place of observation—the degrees being generally longer towards the poles, where the earth is flatter, and shorter at the equator, where the earth is more curved. If the earth were a sphere, a degree would be exactly a 360th part of the meridian. As it is, the length of a degree of latitude depends on the latitude of the place. From a variety of observations conducted at various times and places, from as far back as the time of Eratosthenes (250 B. C.), tables have been constructed shewing the length of degrees at different latitudes. The length of 'the middle degree,' as it is called, or that of places in latitude 45°, may be taken approximately at $69\frac{1}{10}$ English miles. The ascertained differences between degrees of latitude is one of the proofs of the earth's spheroidicity. See Geodesy.

**DEGREE OF LO'NGITUDE** is the space between two meridians that make an angle of 1° at the poles, measured by the arc of a circle parallel to the equator passing between them. It is clear that this space is greatest at the equator, and vanishes at the poles; and it can be shewn that it varies with the cosine of the angle of latitude.

| Degree lat. | English Miles. | Degree lat. | English Miles. | Degree lat. | English Miles. |
|---|---|---|---|---|---|
| 0 | 69·07 | 31 | 59·13 | 61 | 33·45 |
| 1 | 69·06 | 32 | 58·51 | 62 | 32·40 |
| 2 | 69·03 | 33 | 57·87 | 63 | 31·33 |
| 3 | 68·97 | 34 | 57·20 | 64 | 30·24 |
| 4 | 68·90 | 35 | 56·51 | 65 | 29·15 |
| 5 | 68·81 | 36 | 55·81 | 66 | 28·06 |
| 6 | 68·62 | 37 | 55·10 | 67 | 26·96 |
| 7 | 68·48 | 38 | 54·37 | 68 | 25·85 |
| 8 | 68·31 | 39 | 53·62 | 69 | 24·73 |
| 9 | 68·15 | 40 | 52·85 | 70 | 23·60 |
| 10 | 67·95 | 41 | 52·07 | 71 | 22·47 |
| 11 | 67·73 | 42 | 51·27 | 72 | 21·32 |
| 12 | 67·48 | 43 | 50·46 | 73 | 20·17 |
| 13 | 67·21 | 44 | 49·63 | 74 | 19·02 |
| 14 | 66·95 | 45 | 48·78 | 75 | 17·86 |
| 15 | 66·65 | 46 | 47·93 | 76 | 16·70 |
| 16 | 66·31 | 47 | 47·06 | 77 | 15·52 |
| 17 | 65·98 | 48 | 46·16 | 78 | 14·35 |
| 18 | 65·62 | 49 | 45·26 | 79 | 13·17 |
| 19 | 65·24 | 50 | 44·35 | 80 | 11·98 |
| 20 | 64·84 | 51 | 43·42 | 81 | 10·79 |
| 21 | 64·42 | 52 | 42·48 | 82 | 9·59 |
| 22 | 63·97 | 53 | 41·53 | 83 | 8·41 |
| 23 | 63·51 | 54 | 40·56 | 84 | 7·21 |
| 24 | 63·03 | 55 | 39·58 | 85 | 6·00 |
| 25 | 62·53 | 56 | 38·58 | 86 | 4·81 |
| 26 | 62·02 | 57 | 37·58 | 87 | 3·61 |
| 27 | 61·48 | 58 | 36·57 | 88 | 2·41 |
| 28 | 60·93 | 59 | 35·54 | 89 | 1·21 |
| 29 | 60·35 | 60 | 34·50 | 90 | 0·00 |
| 30 | 59·75 | | | | |

The annexed table shews the lengths of a degree of longitude for places at every degree of latitude from 0° to 90°. It is computed on the supposition that the earth is a sphere.

**DEGREES OF LAMBETH.** By 25 Henry VIII. c. 21, sundry powers formerly belonging to the pope were conferred upon the Archbishop of Canterbury, among which was the right of granting degrees. He can confer all the degrees taken in the universities of Oxford and Cambridge, but his degrees do not carry with them all the privileges which belong to degrees conferred by the universities.

**DEGREES OF NOBILITY.** See Nobility.

**DEGREES OF RELATIONSHIP.** See Consanguinity, Affinity.

**DE'I GRA'TIÂ** (Lat. 'by the favour of God'), is a formula taken from several apostolical expressions in the New Testament. It is believed to have been first formally used by the bishops at the council of Ephesus, 431 A. D. Afterwards, it came to be appended by archbishops, bishops, abbots, abbesses, deans, monks, and even chaplains, to their titles, in letters, and other documents, as a humble expression of dependence on the Most High. After the middle of the 13th c., when the sanction of the pope began to be considered necessary to ecclesiastical offices, the higher clergy wrote *Dei et Apostolicæ sedis gratiâ*, 'by the favour of God and the apostolic see.' At a later period, many of them preferred to write *miseratione divinâ*, *permissione divinâ*, and the like; but they still continued to be styled by others *Dei gratiâ*. In the British Islands, this style was generally dropped about the time of the Reformation, but it was occasionally given to the Archbishops of Canterbury and York, even after the beginning of the 17th century. Beginning with the times of the Carlovingians, many temporal princes, earls, and barons made use of the formula Dei Gratiâ; and before the 15th c., no idea of independence or of divine right seems to have attached to it. But in 1442, King Charles VII. of France forbade its use by the Comte d'Armagnac, and in 1449 obliged the Duke of Burgundy to declare that he used it without prejudice to the rights of the French crown. These instances shew that it had now begun to be regarded as belonging exclusively to sovereigns who owed no allegiance to any other earthly potentate or power. In this way, what was originally a pious expression of humility, came to be looked upon as an assertion of the doctrine of the 'divine right' of kings.

**DEINOTHE'RIUM.** See Dinotherium.

**DE'ISM, or THE'ISM,** properly means belief in a God, as opposed to atheism. In common language, however, Deism is opposed to belief in a revelation; and a Deist is one who holds the existence and providence of God, but grounds his belief on reason and the evidence afforded by the constitution of things, and rejects the testimony of a revelation. The name is often used vaguely by way of reproach, similarly to 'infidel.'

The term Deists, or Freethinkers, is sometimes used to designate a school or series of writers who appeared in England in the 17th and 18th centuries, and who aimed at establishing what they called Natural Religion, upon the basis of reason and free inquiry, and then bringing all positive or revealed religion to the test of this. They are looked upon as the precursors of German Rationalism in theology. The leading names in this school are Lord Herbert of Cherbury (died 1648); John Toland, whose *Christianity not Mysterious* (Lond. 1696) gave exact expression to the tendency of the Deists; Lord Shaftesbury; Anthony Collins (died 1729), the friend of Locke; Thomas Woolston; Matthew Tindal, the author of *Christianity as Old as the Creation, or the Gospel a Republication of the Religion of Nature* (Lond. 1730); Viscount Bolingbroke.

**DE'KKER,** Thomas, a dramatist of some note, was born in the latter part of the 16th century. He appears to have applied himself industriously to his vocation, and is said to have written upwards of twenty plays, either wholly or in part. In company with Ben Jonson, he wrote for the Lord Admiral's theatre; the two dramatists, however, afterwards quarrelled. D.'s chief plays are *Fortunatus, or the Wishing-cap*, and *The Honest Whore*. Hazlitt, who regarded the latter as a highly successful comedy, has said that it unites 'the simplicity of prose with the graces of poetry.' D. died about the year 1638. His poetic diction is choice and elegant, but he often wanders into absurdity. His life, like that of many of his contemporaries, seems to have been one of alternate revelry, want, and despair. Recently, D. has become better known by the re-issue of a work of his (not a play), called the *Gull's Hornbook*, which is full of interesting details of the manners of his time.

**DEL** (*Artocarpus pubescens*), a tree of the same genus with the Bread-fruit (q. v.), indigenous to the forests of Ceylon, and valuable on account of its timber, which is used both for house-carpentry and for ship-building.

**DEL CRE'DERÉ COMMI'SSION,** an Italian phrase, borrowed by the law-merchant to express the additional premium charged by a factor or agent, in virtue of which he warrants the solvency of the purchaser, and renders himself personally liable for the payment of the price of the goods sold. It is, in short, what is called a guaranty or warranty in England, and warrandice in Scotland. If the percentage on the price for effecting the sales be two and a half, two and a half more is usually charged as del credere commission.

**DE LA BECHE**, Sir Henry Thomas, a well-known geologist, was born near London in 1796. He was educated at the military school at Great Marlow, and entered the army in 1814. Three years after, he became a fellow of the Geological Society, of which he was afterwards made secretary, and eventually president in 1847. In 1820, while residing in Switzerland, he published a paper, *On the Temperature and Depth of the Lake of Geneva.* Shortly after, he returned to England; and in 1823, in conjunction with the Rev. Mr Conybeare, he issued a paper, *On the Discovery of a New Fossil Animal, forming a Link between the Ichthyosaurus and the Crocodile.* This was the Plesiosaurus. In 1824, De la B. visited Jamaica, where he possessed some property, and while there he devoted himself to the geology of the country, and in two years published a paper on that subject. On his return to England, he wrote a variety of scientific papers, among which are the following: *On the Excavation of Valleys*, *On the Geographical Distribution of Organic Remains*, and his *Geological Manual* (1831), which met with a very cordial reception. He now undertook to form a geological map of England, in which the various formations should be distinctly marked. Shortly after he had begun, the government, sympathising with his design, instituted the Geological Survey, and placed him at its head. In 1848, De la B. received the honour of knighthood; in 1851, he published the *Geological Observer*, with upwards of 300 wood-cuts; and in 1853, was elected a corresponding member of the Academy of Sciences of Paris. He continued to discharge the duties of his position until within two days of his death, which took place on the 11th of April 1855.

**DELACROIX**, Ferdinand Victor Eugene, a modern French painter, chief of the 'romantic school,' was born at Charenton-Saint-Maurice, near Paris, 26th April 1799. At the age of eighteen, he entered the *atelier* of the artist Pierre Guérin. In 1822, he exhibited his first work, 'Dante and Virgil.' It attracted much attention. The love of colour, at the expense of accurate drawing, for which D. afterwards became conspicuous, is quite visible in it. It was highly praised, however, by M. Thiers among others. In 1824, D., who was now at the head of the new school of young painters, produced the 'Massacre of Scio;' in 1826, the 'Death of Marino Faliero,' and 'Greece on the Ruins of Missolonghi;' in 1827, 'Christ in the Garden of Gethsemane,' 'Appearance of Mephistopheles to Faust,' 'The Blind Milton Dictating Paradise Lost,' and the 'Death of Sardanapalus;' and in 1828, 'Cardinal Richelieu.' The July revolution left its impress on D., and in 1831 appeared his 'Liberty directing the People on the Barricades.' About this time, he made a voyage to Marocco, where he familiarised himself with novel effects of light and costumes. The Paris Exhibition of 1852 contained the results of his artistic expedition. From this period, D. has continued to send forth picture after picture, proving, at least, the extraordinary fecundity of his mind. The principal are: the 'Prisoner of Chillon' (1835); 'Cleopatra' (1838); 'Hamlet Contemplating the Skull of Yorick' (1838); 'Capture of Constantinople by the Crusaders' (1841); a 'Shipwreck' (1841); 'Death of Marcus Aurelius' (1845); 'Farewell of Romeo and Juliet' (1846); and 'Flowers and Fruits' (1849). D. has also decorated many public buildings and churches. In 1857, he was chosen by the Institute to fill the place of Paul Delaroche (q. v.).—The most striking quality of D.'s genius is its wonderful versatility. He has painted almost all sorts of subjects, involving a vast variety of costumes. As a colourist, he ranks high, but he is almost equally noted, as has been said, for his incorrect drawing. What renders his pictures so attractive, is a certain dramatic energy of execution, with brilliant effects of light and shadow. He has been compared to Paolo Veronese and Rubens, but is vastly inferior to both. He has also been styled the *Victor Hugo* of painting, a criticism which more nearly expresses the truth.

**DELAGO'A BAY**, an inlet on the south-east coast of Africa, lat. 25° 58′ S., and long. 33° E. It is about 55 miles in length, and about 20 in breadth. Into D. B. many rivers fall, among which are the Delagoa River, from the west, which gives its name to the bay; the Manice, from the north; and the Machavanna, from the south. The shores of the bay being flat and marshy, are unhealthy in summer; the anchorage, however, is commodious and safe, and attracts many whalers. The Portuguese have a small fort here, whence they export ivory and gold-dust. In common with most of the Portuguese possessions on this continent, D. B. lies out of the thoroughfares of the world's traffic.

**DELAMBRE**, Jean Baptiste Joseph, a French astronomer, was born at Amiens, 19th September 1749, and studied first under Delisle, and afterwards under Lalande, with both of whom he formed a close friendship. The discovery of the planet Uranus, in 1781, gave him the first opportunity of attracting the attention of the learned world in general. He formed tables of its motion, which obtained the annual prize of the Academy of Sciences. Soon after, he commenced the construction of new solar tables, and, at a still later period, tables of the motions of Jupiter and Saturn. Along with Méchain, he was appointed by the French government, in 1792, to measure the arc of the meridian between Dunkirk and Barcelona, which was completed in 1799. Afterwards, he was elected member of the academy. In 1802, he was appointed Inspector-general of Education, and in 1803, perpetual secretary of the mathematical section of the Institute. The result of his measurements appeared in his great work, *Base du Système Métrique Décimal* (1806—1810). In 1807, he obtained the chair at the College of France, rendered vacant by the death of Lalande, his master and friend. In 1814, he was appointed a member of the Council of Public Instruction. He died at Paris, 19th August 1822. D. received a multitude of honours during his lifetime. He was a member of most of the learned bodies in Europe, an officer of the Legion of Honour, and a Chevalier of the Order of St Michael. His writings are very numerous. The principal are: *Traité d'Astronomie* (Paris, 1814); *Histoire de l'Astronomie du Moyen Age* (Paris, 1819); *Histoire de l'Astronomie Moderne* (1821); and *Histoire de l'Astronomie au Dix-huitième Siècle* (Paris, 1823—1827), published under the care of Matthieu. Besides these, D. wrote several excellent *Mémoires.*

**DELANE**, John Thaddeus, editor of the *Times* newspaper, was born in London in 1815. He received the earlier part of his education in a private seminary, first in England, and afterwards in France. He then went to Oxford, where he entered himself of Magdalen Hall. His father being manager of the *Times*, he was at a very early age introduced into the editor's room, and on the death of Mr Bacon in 1840, succeeded to the direction. Under his editorship, the *Times* has attained a prodigious circulation, and an influence unparalleled in the history of journalism. The division of labour in newspapers being more complete than in the days of his predecessors, the duty of the modern editor is not so much to write in his own journal, as to suggest topics to others; to revise and bring into harmony conflicting contributions; to make arrangements for the prompt and punctual supply of the news of the day (in which he is assisted by the manager); and, before putting the journal to the press, to decide which of many competing articles and reports shall be inserted, and which laid aside or postponed. These are duties requiring for their due fulfilment great tact, quickness of decision, an extensive knowledge of men and things, literary taste and ability, and, in the case of a journal which claims to be the representative of the English nation, a ready discrimination of those straws on the surface, which denote the ultimate direction of public feeling—qualifications which D. obviously possesses in larger measure than perhaps any journalist who ever lived. He is a member of the Hon. Society of the Middle Temple, having been called to the bar in 1847.

**DELAROCHE**, Paul, a historical painter, the head of the modern 'Eclectic' school of art in France, was born at Paris in 1797, became a pupil of Baron Gros, and between the years 1819 and 1823 acquired some note by painting subjects taken from Scripture, but first excited public admiration in 1824 by his 'St Vincent de Paul preaching in the Presence of Louis XIII.,' and 'Jeanne d'Arc interrogated in Prison by Cardinal Beaufort.' These exhibit the earliest indications of that style for which he afterwards became famous—a style which endeavoured to unite the picturesqueness of the romantic with the dignity of the classic school of art. In 1826, D. produced his 'Death of President Durante;' and in 1827, his 'Death of Queen Elizabeth.' These pictures greatly increased his reputation, but the last is reckoned a failure by English critics. In 1831, appeared his 'Children of Edward IV. in the Tower,' a work of very high merit, but transcended, in this respect, by his 'Cromwell contemplating the Corpse of Charles I.' (1833), which is generally regarded as one of the first historical paintings of modern times. Both are well known in Britain through the medium of engravings. In 1834, appeared his 'Execution of Lady Jane Grey;' and in 1837, his 'Charles I. in the Guard-room Insulted by the Parliamentary Soldiers,' and his 'Lord Strafford on the Way to Execution receiving the Blessing of Archbishop Laud.' From this period until 1841, he was engaged on what is probably his grandest work—the series of paintings executed on the wall of the semicircular saloon of the Ecole des Beaux Arts. This composition contains 74 figures, comprising the greatest sculptors, painters, and architects in all history, according to D.'s judgment. The style is simple, lofty, and chaste. Among his later works may be mentioned, 'Bonaparte at St Bernard' (1850), 'Marie Antoinette before the Revolutionary Tribunal' (1851), 'Moses Exposed' (1852), 'Calvary' (1853), 'Jesus in the Garden of Gethsemane' (1854), 'The Girondins in the Concierge' (1856). He died November 4, 1856.—The characteristic excellences of D. are delicacy of treatment, picturesqueness of conception, harmony of colour, and accuracy of drawing. He has been accused, however, of want of fire, imagination, and depth, and it must be admitted that he very rarely, if ever, exhibits the highest qualities of creative genius. D. was named a member of the Institute in 1832, and Professor of Painting in the Ecole des Beaux Arts in 1833.

**DELAVIGNE**, Jean François Casimir, a French poet and dramatic writer, was born at Havre, 4th April 1793, and educated at the Lycée Napoléon in Paris, where he first attracted notice by his poem on the birth of the 'king of Rome' in 1811. A few years after the fall of Napoleon, he published his *Messéniennes*, a series of patriotic elegies, in which he bitterly deplored the misfortunes brought upon his country by the disaster of Waterloo. The July revolution inspired his song *La Parisienne*, which was set to music by Auber, and he wrote several other revolutionary lyrics, such as *La Varsovienne, ou la Polonaise*, and *La Bruxelloise*. Many offers of employment in political affairs were made to him by Louis Philippe, but he chose to remain a *littérateur*, and worked assiduously at the composition of plays. His incessant labours at length undermined his health, and he retired to Lyon for change of air, where he died, 10th December 1843. D. is, next to Béranger and Scribe, the most popular of recent French poets. He represents that 'golden mean' of the French Parnassus, the half-classic, half-romantic style of poetry. There is nothing extravagant, nothing profound about him. Easily comprehended, moderately liberal, with a slight tincture of scepticism and Voltairian wit, yet, on the whole, rather moral in his tendencies, D. was just the man to charm the more elegant and decorous circles of Parisian society. His language, too, is piquant, picturesque, and select, and skilfully conceals the lack of poetic substance. The titles of his principal dramatic pieces are—*Les Vêpres Siciliennes* (1819) *Les Comédiens* (1820), *Marino Falieri* (1829), *Louis XI.* (1832), *Les Enfants d'Edouard* (1833), *Don Juan d'Autriche* (1835), and *La Fille du Cid* (1839). Several editions of his works have been published, the first in 1845, containing a biography of D. by his brother Germain, and a panegyric by Sainte-Beuve.

**DE'LAWARE**, a term of various application in the United States, indicates a river, a bay, and a state, to say nothing of counties and less important localities.—1. The river D. rises in New York, on the west slope of the Catskill Mountains, commonly reckoned a portion of the Appalachians or Alleghanies; and, in a generally southerly direction, it divides New York state and New Jersey from Pennsylvania and the state of its own name, forcing its way through the great chain above designated between almost perpendicular crags of more than 1000 feet in height, and gradually expanding into a broad estuary. With a course of fully 300 miles, it is navigable for large ships to Philadelphia, and for steam-vessels to the head of tide-water at Trenton. The D. is connected by one canal with the Chesapeake, and by two others with the Hudson; and along the right side of the stream runs a similar work for 60 miles from Easton to Bristol. —2. D. Bay—the estuary of the river—measures about 60 miles in length; the greatest width being 25 miles. It has New Jersey on the left, and D. on the right, its entrance being between Cape May in the former state, and Cape Henlopen in the latter. As numerous shoals make the navigation dangerous and the anchorage inconvenient, an artificial harbour of about 300 acres in extent, and of at least 4 fathoms in depth, has been formed at Cape Henlopen.—3. The state of D., stretching in N. lat. from 38° 29′ to 39° 47′, and in W. long. from 75° to 75° 45′, is situated between Pennsylvania, Maryland, and its own bay and river. With the single exception of Rhode Island, it is the least considerable member of the Union, being very little larger than the county of Norfolk in England. Its area is 2120 square miles, and its population, according to the census of 1860, is 112,222, having been, in 1850, 91,535. Though bondage is permitted by law, yet the number of slaves does not amount to 3000. D. sends to congress one representative and two senators, being therefore entitled to appoint three presidential electors. The constitution appears to be peculiar in two respects—the governor can never be re-elected, and the laws must be renewed every twenty years. The principal products are wheat, maize, oats, potatoes, flax, wool, fruit, and timber; and in addition to woollen and cotton factories, there are tanneries, paper-mills, iron-works, and ship-building establishments. Besides Dover, the political capital, and Wilmington, the most populous city, the other places of any note are Milford, Newcastle, Lewes, Smyrna, and Georgetown. Originally settled in 1627 by Swedes and Finlanders, D. was, in 1655, subjugated by the Dutch of New Amsterdam, afterwards New York. Again, in 1664, it fell, with the Dutch possessions in general, into the hands of the English, ultimately becoming a part of the grant to Penn in 1682; and though in 1701 it was detached from Pennsylvania for legislative purposes, yet it remained subject to the same governor down to the epoch of the Revolution.

**DELAWARES.** See Indians.

**DELE'B PALM**, a palm of great importance to the inhabitants of the regions around Lake Tsad, and other parts of the interior and west of Africa, being in some districts the predominant tree, although very local in its distribution, which extends, however, through the vast tracts from Kordofan to the Atlantic. It is supposed to be nearly related to the Palmyra Palm (q. v.) of India (*Borassus flabelliformis*). Its fruit, when full grown, is 6—8 inches long, and 4 inches thick, yellowish-brown; the pulp a very close and coarse fibrous tissue. It has a mawkish taste; yet it is very much used by the natives of Africa, who also break the stone and plant it in the ground, when in a few days a blade shoots up, and a very tender root is produced, which is very pleasant, and much used as an article of food.—Barth's *Travels*.

**DELE'CTUS PERSO'NÆ** (Lat., choice of the person). In some legal relations, a choice of the person, for some qualification possessing value in the eyes of one of the parties to the contract, is assumed; and the individual so chosen cannot consequently transmit his rights and obligations to another without the consent of the person who is supposed to have chosen him. Thus, in Scotland, in an agricultural lease, of such duration as not to exceed the ordinary life of a man, the landlord is assumed to have chosen his tenant with a special view to his personal qualifications, and unless in virtue of a positive stipulation, the tenant cannot sublet the farm. The reverse is the case with urban tenements. For reasons still more obvious, the same rule holds in partnership; and unless in the case of great companies, where the sale of the stock is provided for, no new partner can be admitted if a single partner object to him. Even the executors and personal representatives of a partner do not succeed to his share. For the same reason, offices of trust are neither saleable nor adjudgeable for debt, though their emoluments may generally be attached for debt.

**DE'LEGATES**, Court of, formerly, the supreme court of appeal in ecclesiastical and maritime causes. Before the time of Henry VIII., the practice had gradually become established of taking ecclesiastical causes on appeal to the court of Rome. By 24 Hen. VIII. c. 12, this practice was abolished, and appeals were directed to be heard by the archbishops of the several provinces. By 25 Hen. VIII. c. 19, it was directed that appeals should finally be referred to the king in council, and his majesty was by the same statute empowered to issue a commission under the great seal to hear the appeals. The court thus established was called the Court of Delegates. It consisted in ordinary causes of a puisné judge from each of the common law courts, and three or more civilians. After sentence had been pronounced by the Court of Delegates, it was competent for the king to grant a commission of review; but this power was rarely exercised, except upon the ground of error in fact or in law. When application for review was made, it was usual to refer to the chancellor the memorial praying for review, and by him the expediency of granting the prayer of the petition was determined. By 2 and 3 Will. IV. c. 92, the Court of Delegates was abolished, and its jurisdiction was transferred to the King in council. And by 3 and 4 Will. IV. c. 41, and 6 and 7 Vict. c. 38, her Majesty is empowered to refer all appeals from ecclesiastical or other courts to the judicial committee of the privy council.

**DELEGA'TION** (Ital. *Delegazione*), the term applied in Lombardy, Venice, and the States of the Church, both to the governing court of a province and to the province itself. Until the recent political changes in Italy, there were nine delegations in Lombardy, and eight in Venice, each of which was presided over by a delegate, vice-delegate, and various subordinates. In the States of the Church, by a decree of 1816, seventeen delegations were established, but the number was several times altered. The delegate was always a prelate, and directly appointed by the pope. If he was a cardinal, he was called a Legate, and his province a Legation.—*Delegados del fomento* is the name given in Spain to the superintendents of the entire police administration of a province.

**DELF**, a heraldic charge, representing a square sod or turf, the term being derived, it is supposed, from the verb to *delve* or dig. A delf tenné is the appropriate abatement for him who revokes his challenge, or otherwise goes from his word. See Abatement.

**DELFT**, one of the most ancient towns of South Holland, is situated on the Schie, 8 miles north-west of Rotterdam. It is intersected by numerous canals, the bridges over which are 69 in number. D. was once noted for its pottery (Delft-ware), but has now entirely lost its high reputation for this manufacture, and not more than 200 persons are engaged in the earthen-ware factories. D. is a dull town, but has several interesting buildings, one of which, the town-hall, is a picturesque and richly adorned edifice. The New Church contains a monument, more ornate than tasteful, to the memory of Prince William I. of Orange, who was assassinated here 10th July 1584. It also contains the tomb of Grotius, and the burial-vaults of the present royal family of Holland. The Old Church, a building of some note, contains the tomb of the naturalist Leeuwenhoek, and of the celebrated Admiral Tromp. D. has also a state arsenal, a college where all matters connected with the management of the dikes are taught, a gymnasium, and infirmary. There are some manufactures of woollen cloths and tobacco-pipes. Pop. 18,500.

**DE'LHI**, a district of India, and one of the administrative divisions of the North-western Provinces, includes but a small portion of the ancient province of the same name. It is situated in 28° 24′—28° 54′ N. lat., and 76° 49′—77° 29′ E. long., having an area of 602 square miles, and a population, in 1848, of 306,550. Exclusive of the city of Delhi—which contains one-half of the population above enumerated, and if the suburbs be reckoned, more than one-half—the district is divided into two pergunnahs. In the pergunnahs, the Hindus bear the proportion of 13 to 2, compared with the other classes; but in the city the difference is little more than 8 to 7. To the south, the district is rocky and barren. The soil generally is sandy or rocky, and the most fertile portions are those to the north and north-west, watered by the Jumna. The grand trunk road from Calcutta runs through the district.

**DELHI** (ancient name, *Indraprestha*, or *Inderput;* Mohammedan name, *Shahjehanabad*), a celebrated city of Northern India, in 28° 39′ N. lat., and 77° 18′ E. long., capital of the province and district of the same name, is situated on an offset of the river Jumna, at about a mile from the right bank of that river, and at an estimated elevation of 800 feet above the level of the sea. The modern city, which was founded by Shah Jehan in 1631, has a circumference of about seven miles. It is protected by ramparts, bastions, &c., and is entered by 11 gates. The greater number of the streets in D. are narrow, but the Chandni Chauk is an exception, being 90 feet broad, and 1500 yards in length, and intersected by an aqueduct. The other principal street is 120 feet wide, and one mile in length. D. has many monuments of its former magnificence. The Mogul's palace was thought by Bishop Heber to surpass the Kremlin. The Jumma Musjid, or principal mosque, was commenced by Shah Jehan in the 4th year of his reign, and completed in the 10th, at a cost of £100,000. This magnificent building has been restored by the British government. The Delhi College was founded in 1792, and in 1829 the sum of 170,000 rupees was bequeathed to it by a minister of the king of Oude. The interest of this sum, together with grants from government, raises its annual revenue to 40,580 rupees. For each of the languages, English, Arabic, Persian, and Sanscrit, there is a separate department. The number of students on the 30th of April 1851, was as follows: Christians, 22; Mohammedans, 206; Hindus, 105—total, 333. According to the census of 1845—1846, D. contained 137,977 inhabitants, of whom 71,530 are Hindus, 66,120 Mohammedans, and 327 Christians; but if the suburbs, with their 22,302 souls, be reckoned, the total population of the city and suburbs will be in round numbers 160,000. The mean temperature of the day has been ascertained, by observations extending over three years, to be as follows: January, 56°; February, 61°; March, 72°; April, 83°; May, 91°; June, 92°; July, 86°; August, 83°; September, 83°; October, 77°; November, 65°; December, 58°. The vestiges of ancient D., on the east bank of the Jumna, consisting of ruined tombs, gardens, serais, and palaces, cover an area of about 30 miles in circumference, and present a remarkable scene of desolation. The modern city is noted for its needle-work, and here the shawls of Cashmere are embroidered in silk and gold. The D. goldsmiths are famous for the delicacy and beauty of their work. D. was the capital of the Afghan or Patan, and afterwards of the Mogul empire. It was taken by a British army under Lord Lake, September 8, 1803, and has ever since —if we except the brief period it was held by the mutineers in 1857—continued under British rule.

In our own time, D. has been rendered memorable by the events of 1857. The march on the city of the mutineers from Meerut, the terrible 11th of May, the explosion of the powder-magazine by Willoughby and his heroic band, the tragic scenes that followed; the siege, the assault (September 14), when the city was won (September 20) gate by gate and quarter by quarter—a success saddened by the death of the gallant Nicholson; the subsequent daring capture of the king of D. by Hodson of Hodson's Horse, and the capture and shooting of his miscreant sons by the same officer, are historical facts still fresh in the recollection of the world. See *The History of the Indian Revolt*, published by the Messrs Chambers in 1859; *The Punjab and Delhi in* 1857, by the Rev. J. Cave Browne, M.A. (Edin. and Lond.), 1861; *Twelve Years of a Soldier's Life in India*, edited by the Rev. George H. Hodson, M.A. (Lond. 1859).

**DELI′CT.** The law of Scotland, following that of Rome, divides delicts into delicts proper and *quasi* delicts—the former being offences committed with a positively malicious purpose, the latter being injuries inflicted by culpable negligence of so gross a kind as to amount almost to crime. The latter class of delicts, though inferring an obligation to repair the injuries sustained by the private party, do not generally form grounds for criminal prosecution. See DAMAGES.

**DE′LILAH** (Heb. the languishing) is the name of a Philistine woman whom Samson loved. By her flattering blandishments, she obtained from him the secret that his God-given strength lay in his locks; and having cut these off while he lay asleep, she then treacherously betrayed the strengthless warrior into the hands of his enemies.

**DELILLE,** JACQUES, a French poet, was born at Aigues-Perse, in Auvergne, June 22, 1738, and received his education at the Collége de Lisieux, Paris. He first occupied the position of instructor at the colleges of Beauvais and Amiens successively, and was afterwards appointed to a professorship in Paris, at the Collége de la Marche. Here he published various poetical effusions, the most considerable of which was a translation of the *Georgics* of Virgil—a work which appeared in 1769, was distinguished by its grace and elegance of style, and met with a most enthusiastic reception. In 1774, he published *Les Jardins*, the success of which, however, was not equal to that of his *Georgics*. The Comte d'Artois presented him with the abbey of St Severin, or rather with its revenues, for he did not insist on D. becoming a priest. His poem *L'Imagination* was written during a visit which he made to Constantinople in 1784, in the suite of Comte de Choiseul-Goubbier, the French ambassador to the Ottoman court. On his return, he was elected professor of *Belles Lettres* at the university of Paris, and of Latin poetry at the College of France. At the Revolution in 1789, however, he lost all his property. He afterwards removed to Switzerland, where, in 1800, he published *L'Homme des Champs.* In 1801, he visited London, published a translation of *Paradise Lost*, and in that same year, having been solicited to return to Paris, he re-entered the academy and the college there with which he had formerly been connected. He died 1st May 1813.

**DELIQUE′SCENCE** is the term applied to the property which certain substances have of absorbing moisture from the air, and becoming damp, and even running into liquid. Caustic potash, and the chlorides of calcium and magnesium, are examples of substances which undergo this change.

**DELI′RIUM** (from Lat. *deliro*, I am furious), a state of deranged mind, in which the intellect and the judgment are perverted or lost, while the imagination and the passions are often excited, or at least left without control. The result is an incoherent or totally disordered course of action and speech, frequently attended by delusions, or unreasoning belief in supposed facts, which the sound mind at once perceives to have no existence in nature. The nature, extent, and variety of the delusions, and the degree to which the control of the reason over them is lost, may be said to indicate the type of delirium to which the patient is subject; and in some instances, the cause of the disease is pretty decidedly shewn forth by the prevailing impressions on the mind and senses. Referring to the article Insanity for the description of Maniacal Delirium, or Mania, and to the article Fever for that of Typhoid Delirium, or Typhomania, we may confine ourselves in the present article to a slight sketch of the delirium arising from habitual intoxication, the *Delirium ebriosorum* or *potatorum* (of drunkards), or, as it is more commonly called, from the bodily tremors that accompany it, *Delirium tremens.* This disease is not to be confounded with the mere paroxysm of intoxication, and still less, if possible, with the insane craving for drink, or Dipsomania (q. v.). It is, on the contrary, often found in persons who have not been recently intoxicated at all, though of persistently intemperate habits, and in whom the desire for drink, as well as for food, has been entirely suppressed by the access of the disease. It is a true though usually a temporary form of insanity or of mania, brought on by the habitual poisoning of the nervous system, over a long course of weeks or months, by alcoholic liquors; and it is not going too far to say that it is rarely, if ever, induced by a single debauch, at least in its aggravated form. Delirium tremens is characterised by a restless, irritable state of the nervous system, rather than by furious paroxysms of excitement (though these are not rare); by constant though ill-regulated and ineffectual attempts of the patient to occupy himself; by spectral illusions, or the vision and hearing of non-existent objects; by tremors of the hands and tongue; by prostration of appetite; and by great wakefulness, the want of sleep being often protracted over many days and nights, and forming, with the constant excitement of the senses, and the prostration of the vital powers from deficient nourishment, the true source of danger in this disease. The main elements in the cure are careful nursing, and the use of all means to secure sleep, and re-establish the digestion. Opium, hyoscyamus, and antimony, are used in some cases, and tonics with laxatives in others; chloroform has also been employed. In certain cases, stimulants are required for a time; but none of these remedies ought ever to be used except under the best medical advice, for there is little doubt that delirium tremens is one of the diseases where the rash employment of strong medicines is extremely dangerous to life, and where good nursing and food, without other remedies, will usually succeed. Where proper protection and vigilance cannot be otherwise secured, the patient should at once be transferred to the nearest hospital or lunatic asylum; and if the attacks have been repeated, he should be detained for some time after his recovery.

**DELI′VERY.** See Parturition.

**DELIVERY IN SALE.** See Sale.

**DELIVERY OF A DEED.** See Deed.

**DE′LLA CRU′SCAN SCHOOL.** About the year 1785, a number of English residents at Florence endeavoured to amuse their lagging hours by writing verses, which they published under the title of *The Florence Miscellany.* The insipidity, affectation, and fantastic silliness of these productions transcend all belief; yet such was the poetic destitution of the period, that they soon found a crowd of admirers and imitators. Taking the name of an academy at Florence (see Academy), the Della Cruscans now began to print their precious lucubrations in England, chiefly in two daily newspapers called *The World* and *The Oracle.* 'While the epidemic malady was spreading from fool to fool,' as Gifford pungently says, one of the brotherhood, a Mr Robert Merry, came over from Florence, and 'immediately announced himself by a sonnet to Love.' It was answered by a certain Anna Matilda, who (as was the custom) praised it immoderately in language even more absurd than Merry's own. According to Gifford, 'the fever now turned to a frenzy: Laura, Maria, Carlos, Orlando, Adelaide, and a thousand other nameless names, caught the infection; and from one end of the kingdom to the other all was nonsense and Della Crusca.' Retribution, however, came (for Nemesis watches the course of poetry as sharply as that of politics). In 1794, Gifford produced his *Baviad,* and in 1796, his *Mæviad.* Rarely has literature witnessed such a scalping. It completely killed the school, and, indeed, it is only in these two poems that the memory of most of the unhappy Della Cruscan songsters has been preserved—an immortality which may be compared with that conferred by the *Newgate Calendar.*

**DELOLME,** Jean Louis, born at Geneva in 1740, was originally an advocate in his native town, but on account of certain political disturbances which took place there, and in which he had shared, he was forced to leave it. He went to England, where, in spite of his literary activity, he lived for several years in great poverty. He returned to his native country in 1775, and died at a village in Switzerland, July 16, 1806. D.'s principal work is *Constitution de l'Angleterre, ou Etat du Gouvernement Anglais comparé avec la Forme Républicaine et avec les autres Monarchies de l'Europe* (Amsterdam, 1771); English translation by the author himself (Lond. 1772). In 1772, he also published in English, *Parallel between the English Government and the former Government of Sweden;* ten years later, his *History of the Flagellants, or Memorials of Human Superstition;* and in 1796, an *Essay containing Strictures on the Union of Scotland with England.* His work on the British constitution, although not reckoned of great value by English critics, contains some acute observations regarding the advantages of a limited monarchy.

**DELORME,** Marion, a Frenchwoman, whose name figures too prominently in the history of the 17th century. She was born about 1612, at a village near Châlons-sur-Marne, and came at an early period of her life to Paris, where her great beauty would easily have secured for her a good match, had she not been inclined to a life of licentious intrigue. Almost all the distinguished men of the age were her 'lovers.' During the first disturbances of the *Frondeurs,* her house was the rallying-point of the chiefs of that party, and in consequence, Mazarin was about to imprison her, when she suddenly died, at the age of 39. A curious tradition sprang up in France during the next century, to the effect that Marion had *not* died, but escaped to London; that she had returned to Paris in 1682; that she, meanwhile, had been thrice married—first, to a lord, second, to a robber-chief, and third, to a procurator of finance; and, finally, that she died in 1706, or, as others say, in 1741, when in her 129th year. Victor Hugo has made her the subject of one of his historical dramas.

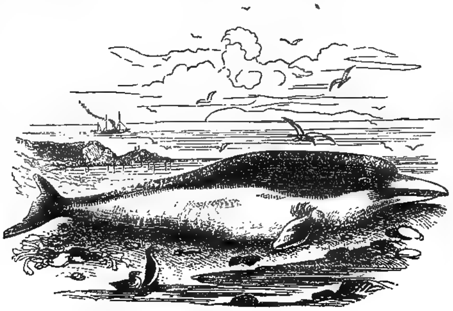
**DE′LOS** (called also in ancient times Asteria, Ortygia, Cynthus, &c.), an island in the Grecian Archipelago, the smallest of the Cyclades, is situated between the islands Rheneia and Mykonus, in lat. about 37° 23′ N., and long. 25° 17′ E. According to the mythological account, it was at first a floating island, but was fixed to the bottom by Zeus, in order that it might become a safe abode to Leto, who, about to bring forth Apollo and Diana, was seeking a refuge from the wrath of Here. Its earliest historical inhabitants were Ionians, and it appears to have been the centre of a great periodical festival held in honour of Apollo, both on the mainland and in the islands. In 426 B. C., D. was purified by the Athenians, all the tombs were removed from it, and it was declared pollution for any birth or death to take place on it. Four years after, the inhabitants of Athens expelled the Delians from the island. After 146 B. C., when Corinth fell, D. became the seat of extensive commerce. Its sacred associations, its great festival, its excellent harbour, and its situation in the direct route from Southern Europe to the coasts of Asia, all combined to render it a port highly favoured by merchants. So great was the traffic of D., that it is said 10,000 slaves changed hands here in one day. After flourishing for a considerable time, it was devastated in the Mithridatic war, and from this calamity it never recovered. Pliny describes D. as being merely a rock, and only five miles in circumference. It was noted for its palm-trees, and also for its brass, and the brazen vessels which it manufactured. The town of Delos, which stood at the foot of Mount Cynthus, a granite crag of from 400 to 500 feet high, is now a mass of ruins. Still, however, the remains of the great temple of Apollo, and of the colossal statue raised in his honour, may be distinctly traced, although shiploads of the more perfect architectural fragments were conveyed, centuries ago, to Venice and Constantinople. A few shepherds and goatherds from Mykonus are now the only inhabitants of Delos.

**DE'LPHI** (now CASTRI), an ancient town of Phocis, Greece, celebrated chiefly for its famous oracle of Apollo, was situated about eight miles north of an indentation in the northern shore of the Gulf of Lepanto (Corinthian Gulf), at the southern base of Parnassus, in lat. 38° 27′ N., and long. 22° 37′ E. Its original name, and that by which Homer invariably speaks of it, was Pytho. It stood in the centre of a district renowned for its classical associations. Occupying the vale of the Pleistus, it was seated in a semicircle like the area of a grand natural theatre, backed towards the north by two lateral spurs of Parnassus. These lateral ranges extend east and west around D., and give rise also, from the point at which they approximate, to the famous fountain of Castalia, the holy water of the Delphian temple. The earliest inhabitants of D. are said to have come from Lycoreia, a town upon one of the slopes of Parnassus, the inhabitants of which are supposed to have been Dorians. From the Delphian nobles were at first taken the chief magistrates and the priests of the temple, while the Pythia or female who delivered the oracle, at first always a young maiden, but latterly always a woman not younger than fifty, was usually selected from some family of poor country-people. In the centre of the temple was a small opening in the ground, whence arose an intoxicating vapour; and the Pythia having breathed this, sat down upon the tripod or three-legged seat, which was placed over the chasm in the ground, and thence delivered the oracle, which, if not pronounced at first in hexameters, was handed over to a poet, employed for the purpose, who converted it into that form of verse. As the celebrity of the Delphic oracle increased, D. became a town of great wealth and importance. In the 8th c. before the Christian era, it had become famous not only in Hellas, but also among the neighbouring nations. Here the Pythian games were first celebrated in 586 B. C. The first stone temple at D., built by Trophonius and Agamedes, was destroyed by fire in 548 B. C., but was rebuilt at the cost of 300 talents, or £115,000, and was fronted with Parian marble. In 480 B. C., Xerxes sent a portion of his army to plunder the temple; but as they climbed the rugged path that led to the shrine, a peal of thunder broke overhead, and two huge crags tumbling from the heights crushed many of the Persians to death, while the others, struck with terror, turned and fled. It was plundered by the Phocians during the Sacred War, and was attacked by the Gauls in 279 B. C., who, approaching by that route which the Persians had on a former occasion adopted, were repulsed by a similar supernatural agency. D. subsequently excited the rapacity of many potentates, and suffered severely by their attacks. Nero carried off from it 500 statues in bronze; Constantine also removed many of its works of art to his own capital. In the time of Pliny, the number of statues in D. was not less than 3000, and within the temple for a long time stood a golden statue of Apollo.

The modern town of Castri now occupies the site of Delphi. Its situation is beautiful, and from it the traveller may command an excellent view of the ancient valley. Castri stands in the immediate neighbourhood of the source of the still flowing Castalian spring.

**DE'LPHIN CLASSICS**, an edition of the Greek and Roman classics, prepared by 39 of the best scholars of the time, under the editorship of Bossuet and Huet, tutors to the Dauphin (q. v.), son of Louis XIV. The title-pages bear the words, 'In usum Serenissimi Delphini,' and hence the name. They have never been reprinted *as a whole* in England, but octavo editions of particular authors, such as Virgil and Horace, have been published for the use of schools. The Delphin Classics possess little value in the eye of a scholar of the present day.

**DELPHINA'PTERA**, a genus of *Cetacea*, of the family *Delphinidæ*, agreeing with *Beluga* (q. v.) in the want of a dorsal fin, but differing in having the snout produced into a slender beak, which is flattened transversely, and separated from the head by a marked furrow. *D. Peronii*, the RIGHT WHALE-PORPOISE of the South Sea whalers, is an inhabitant chiefly of the seas of high southern latitudes, but sometimes found even on the coasts of New Guinea. It is about five or six feet long, black, with brilliantly white belly and snout. Its mouth is furnished with a great number of slender sharp teeth. *D. Commersonii*, also found in high southern latitudes, is about the size of a porpoise, silvery white; the snout, tail, and pectorals tipped with black, and is described as one of the most beautiful inhabitants of the ocean. *D. borealis* was discovered by the United States Exploring Expedition in the North Pacific Ocean.



Delphinaptera Peronii.

**DELPHI'NIDÆ** AND **DELPHI'NUS**. See DOLPHIN.

**DELPHI'NIUM.** See Larkspur.

**DE'LTA** is the alluvial deposit formed at the mouth of a river from the deposition of the particles which it has held in suspension. The term was originally applied to the tract of land thus formed by the Nile, which, being enclosed by two main branches and the sea, has the form of the Greek letter Δ, Delta. The formation of deltas depends more upon the presence or absence of currents met with at the mouth of the river, than upon the quantity of sediment held in suspension when it reaches the sea. Deltas are consequently of almost invariable occurrence in inland lakes, in the quiet estuaries of the nearly tideless Mediterranean, and in the sheltered bays and gulfs of other seas. When, on the other hand, there are strong ebb-tides, or powerful oceanic currents, the detritus is carried off into the sea.

**DE'LUGE** (through the French, from Lat. *diluvium*, a washing away, a flood). There is scarcely any considerable race of men among whom there does not exist, in some form, the tradition of a great deluge, which destroyed all the human race except their own progenitors. That the Noachian deluge, recorded in Scripture, covered the whole earth, was the universal opinion until towards the close of the last century. The organic remains, on which the science of palæontology is now founded, were regarded as its wrecks, and were held to prove that it had covered every known country, and risen over the highest hills. In the progress of geology, it soon became evident that most of the stratified rocks demanded an earlier origin than a few thousand years, and the influence of the deluge was consequently restricted to the slightly altered superficial deposits; but many of these were, after a few years, found to belong to a period vastly anterior to any historical epoch, and to have been produced by long-continued and steady agencies, differing totally from a temporary deluge. The present tendency of opinion among writers like the late Hugh Miller, is to regard the flood of Noah as partial and local, although the universality seems to be implied in the biblical description.

**DE LUNA'TICO INQUIRE'NDO.** See Insanity (legal).

**DE'LVINO**, a town of European Turkey, in the province of Albania, beautifully situated on a hill-slope covered with olive and orange groves, in lat. 40° N., long. 20° 15′ E. It is fortified, is the seat of a Greek bishop, and has a considerable trade in olive-oil. The women's dress is peculiar, being a long white wrapper, enveloping them from head to foot, and giving them the appearance of animated monumental figures. Pop. estimated at 10,000.

**DEMAND AND SUPPLY.** The nature and influence of the law or agency so designated by Political Economists have been the subject of considerable dispute. It has sometimes been maintained as a ruling principle, that the demand for anything creates the supply. This has been denied, however; and it has been held that, on the contrary, the supply precedes the demand, since the article must be in existence before a purchaser goes to ask for it. Steam-engines, for instance, and india-rubber galoshes, must have been invented and made before any one thought of purchasing them. The most convenient way, perhaps, of viewing the term demand and supply, is to consider it as applicable to articles in the market; and here we shall find that the demand and the supply are continually vibrating with a tendency to balance. Sometimes there is more of an article than will sell at a remunerating price, sometimes less; but there is always a strong tendency to a balance. Thus, on any day in London, the supply of beef or of fish may be less than the demand—that is to say, the trade may be so brisk that had there been a few more bullocks at Smithfield, or a few more salmon and turbot at Billingsgate, they might have been sold at remunerating prices. At the same time, there may happen to be an excess of both commodities at Windsor. It never will happen, however, that a supply suited for the London market will find its way to Windsor, or that no more will reach London than might feed Windsor—it would be as rational to expect the river Thames to reverse its course. This is the great law, then, by which the world is supplied with the necessaries of life. Every day the proper supply for the enormous consumption of London is on its way from the uttermost ends of the earth, as systematically as the sap is ascending to penetrate through all the branches of the tree. How impossible it would be to effect the same thing by artificial organisation, may be illustrated from the Russian campaign of Napoleon, where, despite of the most skilful and costly arrangements, one portion of the army were starving to death, while another were slaughtering their bullocks and leaving them to rot! It is necessary to keep in view the proper function of this law, which is in some measure defined under Competition (q. v.). The demand will not produce everything: no money will bring forth when wanted a Milton's *Paradise Lost*, or a Raphael's 'Transfiguration.' On the other hand, there are services beneficial to the world, or to a community, for which there is no demand in the commercial sense. There is a demand for almanacs, but none for the astronomical investigations on which they are founded. There is a demand for teachers of Latin and Greek, and for Latin and Greek school-books, but none for the profound scholarship necessary for keeping the knowledge of these languages alive; hence come scientific and scholastic endowments and establishments.

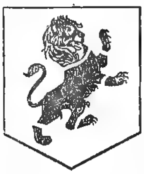
**DEMAVE'ND**, the name of a volcanic mountain in Persia, situated about 40 miles north-east of Teheran. It is said to have an elevation of about 20,000 feet, and is of conical form; several hot springs have their source at its base.

**DE'MBËA**, Lake of, in Abyssinia, is situated in lat. 12° N., long. 37° 15′ E., and is about 60 miles in length, with an average breadth of 25 miles. It occupies part of an extremely fertile plain, situated at an elevation of some 6000 feet above the sea, and contains several beautiful islands, one of which is inhabited. Its southern portion is traversed by the Blue Nile.

**DEMBI'NSKI**, Heinrich, a Polish general, best known in Britain through his connection with the Hungarian revolution, was born in the palatinate of Cracow, 16th January 1791, entered the Polish army in 1809, took part in the invasion of Russia by the French in 1812, and was made captain by Napoleon himself on the battle-field of Smolensk. He subsequently distinguished himself at Leipsic. After the fall of the Empire, he returned to his native country, and lived in comparative obscurity for some time. The Polish revolution of 1830 called him again to arms. He obtained the command of a brigade of cavalry, and exhibited heroic courage at the battle of Kuflew. Afterwards, he made the campaign of Lithuania, under Gielgud; and arriving in Warsaw—having traversed the entire Russian lines—was made commander-in-chief of the national army. After the surrender of Warsaw to the Russians, D. went to France, where he published his *Mémoires sur la Campagne de Lithuanie* (Strasbourg, 1832). In

1833, he proceeded to Egypt, and entered the service of Mehemet Ali, but returned to Paris in 1835. On the outbreak of the Hungarian insurrection, he offered his services to that country, and Kossuth appointed him commander-in-chief of the Hungarian army. He drew up a plan of the campaign, but could not obtain the concurrence of Görgei, whose tardy arrival caused the loss of the battle of Kapolna (26th—28th February 1849). Forced to retreat behind the Theiss, D. resigned his command, but subsequently consented to act under Messaros. He strongly urged the necessity of uniting the cause of Hungary with that of Poland, and proposed to lead an army into Galicia; but his advice was not taken. After the resignation of Kossuth, and the capitulation signed by Görgei at Vilagos (13th August 1849), D. fled to Turkey. In 1850, he returned to France, and commenced to write his *Mémoires* on the Hungarian war. He is still living, but his *Mémoires* have not yet been published.

**DEMEMBRÉ**, or **DISME'MBERED**, a heraldic term to signify that the members of an animal are cut from its body.



Dismembered.

**DEME'NTIA.** See INSANITY.

**DEMERA'RA**, a district and river of British Guiana (q. v.). The river D. is upward of 200 miles in length, is 1½ mile broad at its mouth, and is navigable by ships of considerable burden for 100 miles. Its affluents are numerous though small, and at its embouchure into the Atlantic it affords a spacious harbour, obstructed, however, by a bar. It has many settlements on its banks.

**DEME'SNE** (Lat. *Terræ dominicales. Dominicum*), in the present day, may be said to be the right which the owner in possession of lands in fee simple has in his estate. But the original signification of demesne was that portion of the lands of a Manor (q. v.) which the lord of the manor reserved for his immediate use and occupation. The lands so reserved were either in the cultivation of the lord of the manor or his Villeins (q. v.), and were thus distinguished from lands granted or subfeued to vassals for services to be rendered. So long as the practice of sub-infeudation continued, the demesne lands were a distinct and separate right; but the statute *Quia Emptores*, 18 Ed. I., having abolished sub-infeudations, and declared that on every transfer of land the feofee should hold of the lord paramount, all lands became of necessity demesne, being in the actual possession of the owner or his tenants.

**DEMESNE**, ANCIENT, a species of Copyhold Tenure (q. v.). Lands held in ancient demesne are said to have belonged originally to vassals of the crown. The services rendered were determinate, not variable at the will of the lord, and more honourable than those of copyhold in general. The tenants also were entitled to certain privileges and exemptions from feudal services. But in process of time, the character of the services appears to have varied; so that in the present day tenants in ancient demesne in some instances differ little from ordinary copyhold tenants.

**DEME'TER.** See CERES.

**DEME'TRIUS**, PHALE'REUS, so named from the Attic demos of Phalerus, a seaport of Athens, where he was born about 345 B. C., was distinguished as an orator and politician. Though descended from a family possessing neither rank nor property, yet by the resolute and persevering exercise of his abilities, he rose to the highest honours at Athens. Having been educated in the school of Theophrastus, he entered upon public life about 325 B. C., and soon made himself famous by the display of great oratorical talent. In 317 B. C., D. was placed by Cassander at the head of the administration of Athens, which office he discharged with such acceptance for nearly ten years, that the grateful Athenians, during that time, heaped all kinds of honours upon him, and erected to him no less than 360 statues. During the later period of his administration, he seems to have given himself up to dissipation; and when Demetrius Poliorcetes, king of Macedonia, approached Athens with a besieging army, in 307 B. C., D., having lost the sympathies and co-operation of the Athenians, was obliged to flee. All his statues were demolished except one. D. retired first to Thebes, but afterwards found refuge in the court of Ptolemy Lagi, at Alexandria, where he lived for many years, devoting himself to literary pursuits. On the death of his protector, D. was expelled from the court of Egypt, and retreating to Busiris in Upper Egypt, he is said to have died there from the bite of an asp, 283 B. C. D. was the last of the Attic orators worthy of the name. His style was graceful, insinuating, and elegant; bearing, however, in its luxuriousness and tendency to effeminacy, the marks of a declining oratory. The list of his works (50 in number) given by Diogenes Laërtius shews him to have been a man of most extensive acquirements.

**DEME'TRIUS**, the assumed name of four different persons who figure prominently in Russian history between the years 1603—1613. In 1584, Ivan the 'Terrible' died, leaving two sons, Fedor and Demetrius, the former of whom ascended the throne, but proved a weak ruler, and was completely under the control of his brother-in-law, Boris Godunoff; the latter, D., was brought up at a distance from the Muscovite court, and when only nine or ten years old, either accidentally killed himself, or, which is more probable, was put to death. In 1598, Fedor died also, and Boris ascended the throne, but his tyrannical measures rendered him very unpopular. In 1603, a strange story reached Russia. It was affirmed that D. was not dead, but had appeared in Poland. The *fact* was, that a person calling himself D., but who, it was asserted, was in reality a monk, named Grishka Otrepiev, belonging to the convent of Tchudoff, had found means to persuade Prince Wisniewski in Lithuania, and afterwards Mniszek, Palatine of Sandomir, that he was the true son of Ivan. The latter introduced him to Sigismund III., king of Poland, who saw in him a useful instrument for introducing Polish influence into Russia, and so aided him in his designs against Boris. Towards the close of 1604, he invaded Russia, repeatedly defeated Boris (who died April 1605), and entered Moscow in June, the people receiving him with every demonstration of enthusiasm. He ruled for some months with vigour; but his manifest predilection for the Poles soon excited the Russians against him, and the arrival of his bride, Marina Mniszek, the daughter of the Palatine of Sandomir, on the 12th of May 1606, brought the discontent to a head. Sixteen days later, an insurrection broke out in the capital, headed by Prince Wasili Shuiski. D. was slain, and a multitude of the Poles massacred. Wasili Shuiski now ascended the throne; but in the following year, an individual appeared alleging that he was D., and that another had been mistaken for him in the Moscow massacre. He found a considerable number of adherents, especially when Marina acknowledged him to be her husband. The Poles also helped him, and for some time it seemed likely that he would succeed; but at length he was put to death at Kaluga in 1610. The third *false* D. gave himself out to be the son of the first. After a brief career, he fell into the hands of the czar, and was strangled. The *fourth* made the same pretensions, but falling into the hands of the Cossacks, was carried to Moscow, where he was executed in 1613.

**DE'MI, or DE'MY** (half). In Heraldry, an animal is said to be demi when only the upper or fore half of it is represented. In inanimate objects, the dexter half per pale is usually intended, when it is said to be demi, though a *demi-fleur-de-lis,* for example, may be a *fleur-de-lis* divided per fess.

**DE'MI-BA'STION,** in Fortification, is a kind of half-bastion which frequently terminates the branches of a crown-work or horn-work, and which is also occasionally used in other places. See Bastion, Crown-work, Horn-work.

**DE'MIDOFF,** a Russian family who in Russia occupy a position as capitalists similar to that held by the Rothschilds elsewhere, and who are not more celebrated for their wealth than they are for their beneficence.—Nikita Demidoff, the founder of the family, was a serf in the time of Peter the Great, but, leaving the place of his birth in order to escape being taken as a recruit, he afterwards became famous as a manufacturer of arms, and before his death had amassed an immense fortune. In 1699, he established an iron-foundry, under the auspices of Peter the Great, in whose favour he had attained a high position, near Neviansk, on the eastern base of the Ural Mountains; this being the first iron-foundry ever established in Siberia. He subsequently erected numerous other forges among the solitudes of the Urals, and realised from them very great riches.—Akimfi Demidoff, son of the preceding, employed German workmen to explore the rich mines of gold, silver, and copper, that are found in the valley of the Irtish, and the upper reaches of the Obi. In 1725, he built, at the foot of the Magnetic Mountain, in Siberia, a foundry called Nischneitagilsk, which is still the most important in all Siberia. The Russian government, sensible of the great service done to the country by the labours of such a man, conferred upon the enterprising metallurgist the title of Counsellor of State.—His son, Procope, founded in 1772 a school of commerce at Moscow, intended to furnish a complete education for the sons of Russian tradesmen. This establishment was transferred to St Petersburg in 1800.—Paul Demidoff, cousin of Procope, also a man of energy, travelled extensively when young, devoting himself to the cultivation of the natural sciences. He presented to the university of Moscow a valuable museum of natural history, and founded also, in 1803, the Demidoff Museum, at Yaroslavl.—Nicholas, Count Demidoff, nephew of the preceding, born in 1774, distinguished himself while young as an aide-de-camp in the war against the Turks. Later, he married the Countess Stroganoff, and became a privy councillor and imperial chamberlain. His taste for the fine arts and for the natural sciences led him to travel extensively; he also caused the workmen whom he employed in his mines to travel, in order to acquaint themselves with the processes of foreign miners. In 1812, he fought at the head of a regiment which he himself raised and led against the French. His death occurred in 1828. A collection of his works, entitled *Opuscules d'Economie Politique et Privée,* was published at Paris in 1830. Of his two children, Paul and Anatol, the former died young, leaving the great bulk of his fortune to the latter, who was born in 1810 or 1812, and was educated in France. He was always remarkable for his enthusiasm in letters and in the sciences. His principal book, published at Paris in 1839, and of which an English translation appeared at London in 1853, is entitled *Travels in Southern Russia and the Crimea, through Hungary, Wallachia, and Moldavia.* Demidoff, in 1840, married the Princess Mathilde de Montfort, daughter of Prince Jerome Bonaparte. After five years, the marriage, by which there had been no children, was by mutual consent dissolved. Demidoff, on the 19th June 1856, presented the town of Spa with a bust of Peter the Great. Russia, as well as other countries, owes the foundation of many valuable charitable institutions to the philanthropy of Demidoff. Demidoff died at Baden, 13th July 1858.

**DEMI-GORGE.** See Bastion, Gorge.

**DEMI-LUNE,** in Fortification, is a work constructed to cover or defend the curtain or wall of a place, and the shoulders of the adjoining bastions. It is composed of two faces, forming a salient angle towards the open country outside the place. It has two demi-gorges, formed near the counterscarp, and is surrounded by a ditch. See further under Lunette and Ravelin.

**DEMI'R-HISSA'R** ('iron-castle'), a town of European Turkey, in the province of Roumelia, in lat. 41° 12′ N., long. 23° 28′ E. It is situated on a tributary of the Karasu, at the foot of an old fort-crowned hill, is fortified, and contains several mosques and a Greek church. Pop. 8000.

**DEMI'SE.** See Lease (English).

**DEMISE OF THE CROWN.** That 'the king never dies,' is a maxim of the public law of this country, in accordance with which, immediately on the death of the reigning monarch, the sovereignty passes to his successor, by the act of the law itself. No installation, proclamation, coronation, or other ceremony is required to vest the new sovereign in the regal office, and thus there is no interval or interregnum, and the royal dignity remains perpetual. The word demise has, in English law, the more general signification of a lease or conveyance, by which a man grants lands or tenements to another for life, for years, or at will; such estate being short of the lessor's own interest therein. It is thus, as it were, by a sort of courteous and loyal analogy that it is employed to signify the death of the sovereign. 'So tender,' says Blackstone, 'is the law of supposing even a possibility of his death, that his natural dissolution is generally called his demise, an expression which signifies merely a transfer of property.'

**DE'MISE'MIQUAVER,** half a semiquaver, or the 32d part of a semibreve. See Notation.

**DE'MIURGE** (from Gr. *demos*, people, and *ergon*, a work; hence a handicraftsman) was the name given in the cosmogony of the Gnostics to the creator or former of the world of sense. He was conceived as the archon or chief of the lowest order of the spirits or æons of the pleroma; mingling with chaos, he formed in it a corporeal animated world. He created man, but could impart to him only his own weak principle, the *psyche* or sensuous soul; therefore the highest, the really good God, added the divine rational soul, or *pneuma.* But the power of evil in the material body, and the hostile influence of the merely sensuous demiurge, prevented the development of that higher element. The demiurge holding himself to be the highest God, could not bring his creatures to the knowledge of the true Godhead; as the Jehovah of the Jews, he gave them the imperfect law of Moses; which promised merely a sensuous happiness, and even that not attainable; and against the spirits of the *hyle,* or world of matter, he sent only a psychical, and therefore powerless Messiah, the man Jesus. See Gnosis.

**DEMMI'N**, a town of Prussia, on the river Peene, on the borders of Pomerania and Mecklenburg, in lat. 53° 50′ N., long. 13° 1′ E. Besides the town proper, D. comprises three suburbs. It has four public squares and a town-house, and manufactures of woollens, linens, hats, and leather. It has also distilleries and breweries, and some trade in tobacco, gloves, &c. Pop. 6140. D., which is a place of some antiquity, was a walled and fortified town during the 12th century. It suffered considerably during the Thirty Years' War, previous to which it was of much more importance than it has since been.

**DEMO'CRACY** (Gr. the rule of the people). It is interesting to trace the progress of this idea, which now plays so important a part. In Greece, whence we derive the name, it was understood to mean a commonwealth so constituted that the power was exercised by the body of the citizens (the *demos*), and not by an individual, or by a dominant caste. Democracy, therefore, stood opposed both to monarchy and aristocracy. Most of the republics of Greece, more especially that of Athens, were democracies in this sense. The name by no means implied the notion of an absolutely equal right in all citizens, still less in all men, to the exercise of political power. Neither the total absence of rights of all kinds on the part of the larger half of the population, the slaves, nor the distinctions recognised by law among citizens proper (e. g., the exclusion of the poorer citizens from office under the Solonian constitution at Athens), were considered incompatible with the nature of a democracy; though in regard to inequalities among citizens, the continually growing force of the democratic principle tended to their gradual extinction, and the transference of power to the mass of citizens without distinction. Aristotle regarded this as an encroachment of *ochlocracy* (mobocracy), the degenerate form of democracy, or democracy proper. Or more frequently, he speaks of democracy as the degenerate form of the polity (Gr. *politeia*). The polity with him was the form where the many govern for the common benefit.—*Polit.* III. chap. 5, and IV. chap. 6.

In modern history, we meet at the very threshold a state of society which may be called democratic. Among the German nations, we find an almost perfect equality of all freemen (i. e., all that were not slaves), and real self-government exercised by these freemen in each separate tribe. For the personal distinction enjoyed by certain families gave them no privileges over the other freemen, and where royalty existed, it could hardly be said to rule, since the king could do nothing without the concurrence of the assembly of freemen, and reigned not by mere birthright, but required the confirmatory choice of the people.

This condition of general liberty and equality gave place gradually to one of a quite opposite kind. Through the growth of the Feudal System (q. v.), the majority fell into a more or less abject dependence upon a privileged minority. The mass of former freemen, now sunk into serfdom, were hardly distinguishable from those properly slaves, whose position, on the contrary, was become less dependent. The dominant class, the nobility, branded all that did not belong to themselves as 'people,' 'commonalty,' 'canaille.' Thus the term 'people,' which in the ancient republics implied the rights of citizenship, came to denote the masses that were without rights. The distinction between the dominant class and the mass of the people rested chiefly on two points—exclusive occupation in war, and the free possession of land, which was granted for warlike service alone.

But within this system of graduated dependence, from the monarch down through the aristocracy and their retainers in various degrees, there sprang up slowly an opposing element, which, as originating in the mass called the people, we may designate as democratic. It was not so much a new element, as the resuscitation of the old Roman municipal life, which had never altogether become extinct. It was of course in the cities that this fresh element first manifested itself. Here, instead of a lord with a group of dependants, there arose communities of men with equal rights and self-government. At the same time, a new material interest, that of movable property, the product of industry and commerce, began to claim recognition alongside of territorial possessions and nobility. In England, as early as the Anglo-Saxon times, a merchant who had made three voyages ranked with a thane; and soon after the Norman Conquest, the cities were represented in parliament on an equal footing with the warlike aristocracy. This took place later on the continent, and never to the same extent, except in the cities of Lombardy and Flanders, where, at an early period, the citizen element entered the lists with the feudal and warlike. Even within the cities, the same contest was carried on between aristocracy and democracy. At first, it was only those carrying on commerce on a large scale that asserted their right to take part in the municipal government of the towns; but the trades or guilds soon set up the same claims. These claims were pertinaciously prosecuted, and often led to bloody contests, but sooner or later were everywhere victorious. Thus was the basis of democracy widened; although the guilds also did not fail to manifest an aristocratic and exclusive spirit towards the body of the people not belonging to them, and with their restrictions and monopolies acted oppressively to the country population. It was not so easy for these last to break the bonds of feudal subjection in which they were held, or to acquire any political standing. Isolated attempts to throw off the yoke, by peasant insurrections and wars, failed, and only were followed by increased oppression. The abrupt division between the feudal possessor of the soil and the serfs under him continued long everywhere except in England. There the rigour of the relation began early to give way, and the transition was effected in such a peaceable and gradual way, that the English historian cannot say exactly how or when. For the greater part of the continent, it was not till the French Revolution in 1789, and the impulse given by it to legislation in other countries, that the agricultural population acquired more or less complete freedom and equality with other classes.

Thus had one part after another of that 'people,' so oppressed and contemptuously thrown into the background by the dominant class in the middle ages, emerged from bondage, and successfully asserted a participation of rights that were at one time the privileges of a single class. The aristocratic principle of feudal society, the principle of exclusion, privilege, of the subjection of the majority to a minority, had given way to the democratic principle of the equal rights of all classes, of all callings and employments. But the development of this last principle was not yet complete. Those who had made good a position in the state alongside of the feudal aristocracy, formed in their turn an exclusive class, taking their stand on certain material grounds. Thus, the merchants, as representing large masses of capital; the guilds, with their privileged industry; the agriculturists, as possessors of land, however little: all these interests formed, as it were, another aristocracy within the democracy. They were democratic in their origin, and as compared with the class that was at one time exclusively privileged; but in another point of view they were aristocratic, since there still remained without a numerous body, which, instead of elevating to political power with them, they rather repelled, and treated much as the nobility had treated themselves. This residuary mass, which now came to be chiefly designated by the name 'people,' comprehended all those who possessed no capital, no privileged trade or calling, no land—nothing, in short, but their personal powers and capacities for work. This class forms at the present day by far the most numerous portion of the population in nearly all the civilised states of Europe. The designation 'people,' intended to be depreciative, is taken by them in the very opposite sense, and they ground upon it their claim to rule the state, as being properly the people, the numerically strongest class of the community. The preference given to the class of possessors, they look upon as groundless and absurd, just as these had judged of the nobility; they therefore claim perfect equality with them, especially in the exercise of the highest political rights. It is from this point of view that universal suffrage and the rule of mere numbers, without regard to possessions or other conditions, has been proclaimed as a self-evident consequence of the democratic principle.

With this there is connected in many quarters a still further extension of the idea. The same principles, it is said, that have dictated political reformations, call for a remodelling of the social arrangements of mankind; that the possessors of property, the *bourgeoisie*, ought to be deprived, not only of the political privileges they have hitherto enjoyed, but also wholly or in part of the material basis of those privileges, their property, so as to produce a perfect equality, political, material, and social, of all classes. This gives rise to a division of the democrats of the present day into two parties: the purely democratic party, aiming only at securing the political consequences of the democratic principle—universal suffrage, and the absolute equality of social rights; and the 'democratic and social,' who look upon the attainment of political rights as only a means of ultimately securing the general social equality of men.

There seems, however, to be a fundamental error in thus treating the relation between the possessionless class and the possessors as analogous to that between the serfs and lords of feudalism. The contest of democracy against feudalism was not primarily so much for equal rights as for this, that among the same people mere birth should not make one man privileged, and a ruler; another destitute of all rights, and bound to obey. It was a contest for personal freedom, the right for every man to use his powers for his own behoof, and not for that of a master; the right to the free possession of land, &c. Participation in political rights was chiefly prized as a guarantee for securing this personal and social liberty. Now, there is no such absolute distinction between possessors of property and non-possessors, as between the nobleman and *roturier* of the middle ages; the two classes run imperceptibly into one another. Still less does the one class exercise any right of controlling the personal freedom of the other in respect of labour and acquisition, as was the case in villenage and feudal servitude. Possession has endless gradations, and in the present day, he who had nothing at the outset often becomes a capitalist, and the reverse. There may be other reasons for wishing that there were less abrupt differences of possession, and greater social equality between the lower and middle classes than society actually presents (see SOCIALISM); but this by no means follows necessarily from the notion of democratic equality. All that this notion requires, seems to be the removal of all privileges that destroy the unity and homogeneity of a nation, the establishment of complete personal and social liberty, and of the equality of all in the eye of the laws; and, in regard to political rights, or direct participation in the government of the state, such a form of constitution as will exclude no fixed class of citizens as such. All this, however, seems quite compatible with making the exercise of the different political functions dependent, in the case of each individual, on certain guarantees, and not admitting the whole body of the people to share in the government of the commonwealth at once, but only in proportion as increasing culture renders a wider circle capable of such functions. If we may judge from the example of England and Belgium, this is the way in which the real and steady progress of the democratic principle is best secured.

In France, the feudal principle, instead of a timely compromise with the democratic, as in England, came to a struggle with it of life and death. The consequence was that victorious democracy, instead of seeking to satisfy the practical wants of society first, and leaving the theoretical to be attained gradually, undertook to reorganise at one stroke the whole political and social fabric. In Germany, things took lately a similar course. The case of America is peculiar. There the foundation of the state structure was to be laid on a clear site, and the first page of the history to be written. Those who came together to form the new community were personally perfectly free and equal, and the local circumstances were such as to favour the exercise of this liberty and equality, by rendering any very great disparity in material means impossible. In such circumstances, the construction of a perfectly democratic order of society could be carried out without struggle, and without any dangerous straining of the principle. There no one looks upon the restriction of the franchise to residents—which is the law in most states of the Union—as an infringement of the democratic principle. Norway bears no little resemblance to America; in that country, the democratic element was never so completely crushed as in other parts of the continent, and that form of society is favoured by the means and style of living, which are extremely simple, and are based on a nearly equal division of the soil.

In the development of democracy in modern times, circumstances have directed its attacks rather against the aristocratic, than against the monarchical principle. At one time, monarchy, in its struggle with the aristocracy, found its natural allies in the democracy. The princes, in striving to break the power of the great nobles, which limited their own, often called in the help of the democratic element, partly by conferring privileges on bodies of the people, such as city corporations, and partly by attaching individuals of the non-privileged classes to their personal service, and appointing them to influential positions in the state. The road to power and distinction was, it is true, already open to individuals of the democracy through the church, whose dignities and privileges were not confined to the noble by birth, but were accessible to personal capacity. At a later period, the universities, especially in the faculty of law, formed for the democracy stepping-stones to power, from which they sometimes overtopped the aristocracy of birth. And when the princes—at their head the Louis of France—aiming at absolute authority, sought to find a counterpoise to the feudal nobility, by creating a bureaucratic state machinery, and favouring intelligence in every form, the very widest path was opened to the democratic element for attaining influence and distinction. It is true that all this was at the cost of its most essential principle; for the equality created by a levelling absolutism, raising the low and depressing the high, was nothing more than an equality of dependence upon the one absolute master of all.

The relation between democracy and monarchy was different where the ruler came to be limited as the chief officer of the nation. Such a limitation of the power of the monarch, by means of a representative system not confined to the privileged classes, but embracing at least the citizens of towns, was in itself a victory of the democratic principle. As the circle of this popular representation widens, and its influence in the state increases, such a monarchy becomes more and more democratic in all its institutions.

In a purely democratical state, the people may exercise their power in either of two ways—directly, or through delegates: in the one case, the democracy is said to be absolute; in the other, representative. The absolute or direct form prevailed in the republics of antiquity; political representation, in fact, seems to be a modern idea. The same is the case with the original Swiss cantons, where almost all public business is discussed in a full assembly of the people. In Switzerland generally, the representative form is now preferred. It is also carried out in the states of North America, and was adopted in the French republic of 1848. The absolute form, in fact, is only adapted for small communities with a population concentrated as to space, and differing little in mode of life or culture. According to some, the representative system is inconsistent with the principle of democracy, as the will of the people is liable to be falsified and crossed by the very organs that are to carry it into execution. It is rather an advantage, however, that the first impulse of the public will, sometimes passionate and short-sighted, should be tempered and enlightened, by passing through a series of media on its way to action; and the hold which the constituency have upon their representatives, by means of frequent re-election, and in other ways, is sufficient guard against any defeat of a steady, earnest, public conviction.

M. de Tocqueville and Mr J. S. Mill have applied themselves to setting forth the evils and dangers of democracy, which they—the latter especially—both regard not only as a system that must inevitably extend itself, but as the ideally perfect form of government. Mr Mill is at great pains to shew that self-government by a representative democracy is what develops, in the greatest degree, the good mental qualities, both intellectual and moral, of the governed, and that it is desirable gradually to extend this participation in the acts of government till it include the entire adult population, male and female. On the other hand, there are two sources of evil to which we are liable, more or less, as democracy approaches to the term of universal suffrage, and which are to be provided against by proper constitutional arrangements. The first of these is the insufficient mental qualifications of the governing body for the highly complicated work of government. Public administration is a profession, like engineering, medicine, or the law, and demands, no less than these, a special training and devotion of mind. In monarchies and aristocracies, the management of affairs is in the hands of a few, who make it the business of their life, and acquire the requisite skill for doing the work well. In a democracy, this advantage is lost, except in so far as the details of administration are left to skilled officials; the public assembly merely retaining the power of checking and controlling those officials, and of determining general rules of policy.

The other danger is the predominance of the labouring class, by virtue of their numbers, over the class made up of employers of labour, and the rich and educated generally. When there are two or more classes in the community with conflicting interests, the desirable arrangement is, that their power should be equally balanced, so that no party could carry a point by political position alone, or without appealing to the reason, and sense of justice, of some members of the other parties. But if the suffrage were universal, the labouring-class interest would be the predominant one; and so serious would be the danger of class legislation as a result, that Mr Mill thinks it necessary to provide a remedy in the shape of granting a plurality of votes to certain persons, especially those distinguished by education, so as to restore the balance.—*Considerations on Representative Government*, chap. viii.

**DEMO'CRITUS**, an illustrious Greek philosopher, was born at Abdera, in Thrace, about 470 or 460 B.C. Of his life, little is known. The statement that he was first inspired with a desire for philosophic knowledge by certain Magi and Chaldæans whom Xerxes had left at Abdera, on his Grecian expedition, is as untrustworthy as that which represents him as continually laughing at the follies of mankind. His extensive travels, however, through a great portion of the East, prove the reality of this desire, as does also his ceaseless industry in collecting the works of other philosophers. D. was by far the most learned thinker of his age. He had also a high reputation for moral worth. He appears to have left a strong impression of his disinterestedness, modesty, and simplicity on the mind of the community, for even Timon the scoffer, who spared no one else, praised him. The period of his death is uncertain. He lived, however, to a great age. Only a few fragments of his numerous physical, mathematical, ethical, and musical works are extant. These have been collected by Mullach (Berlin, 1843). Cicero praises his style, and Pyrrhon imitated it.

D.'s system of philosophy is known as the *atomic system*. Its essence consists in the attempt to explain the different phenomena of nature—not like the earlier Ionic philosophers, by maintaining that the original characteristics of matter were *qualitative*, but that they were *quantitative*. He assumes, therefore, as the ultimate elementary ground of nature, an infinite multitude of indivisible corporeal particles, *atoms* (see ATOM), and attributes to these a primary motion derived from no higher principle. This motion brings the atoms into contact with each other, and from the multitudinous combinations that they form, springs that vast and varying aggregate called *nature*, which is presented to our eyes. D. did not acknowledge the presence of *design* in nature, but he admitted that of *law*. 'The word *chance*,' he says, 'is only an expression of human ignorance.' He believed strictly in secondary or physical causes, but not in a primary immaterial cause. Life, consciousness, thought, were, according to him, derived from the finest atoms; those images of the sensuous phenomena surrounding us, which we call mental representations, were, according to him, only material impressions, caused by the more delicate atoms streaming through the pores of our organs. D. boldly applied his theory to the gods themselves, whom he affirmed to be aggregates of atoms, only mightier and more powerful than men. Strange to say, the ethical system of D.—in spite of the grossness of his metaphysics—is both pure and noble. Such fragments of his writings as we possess contain beautiful, vigorous, and true thoughts concerning veracity, justice, law, order, the duties of rulers, &c.; while, in a spirit not alien to the teaching of Christianity, he looks upon an inward peace of heart and conscience as the highest good, the end and the aim of all virtuous endeavour.

**DE'MOISELLE** (*Anthropoides*), a genus of birds of the family *Gruidæ* (cranes), differing from the true cranes in having the head and neck quite feathered, and the *tertials* of the wings elongated and hanging over the tail, so as in some species to reach the ground. The D., or NUMIDIAN D. (*A. Virgo*), is about 3 feet in length from the point of the bill to the tip of the tail, and the top of its head is about $3\frac{1}{2}$ feet from the ground. It is remarkable, as are all its congeners, for elegance and symmetry of form, and grace of deportment. The general colour of its plumage is gray, but the sides of the head are adorned with two elegant white tufts, formed by elongation of the ear-coverts, and a tuft of blackish feathers hangs down from the breast. The D. is an African bird, but visits Greece and other parts of the south of Europe. To the same genus belongs the beautiful Stanley Crane (*A. paradisæus*) of the East Indies, a larger and taller bird, with very long tertials. Notwithstanding its large size, it seems to feed chiefly on the insects of marshes, which it takes when on wing.

Demoiselle (*Anthropoides Virgo*).

**DEMOIVRE**, ABRAHAM, a distinguished mathematician, was born at Vitri, in Champagne, 1667, and died at London in 1754. Of French extraction, he spent most of his life in England, whither he fled, with many others, for shelter in 1685, on the revocation of the Edict of Nantes. He long supported himself by private tuition and public lecturing, and, towards the end of his life, by answering questions in chances, play, and annuities, most of his responses, it is said, being given at a coffee-house in St Martin's Lane, where he passed much of his time. The appearance of Newton's *Principia* incited him to increased devotion to mathematical studies, to which he had always been disposed, and at last he ranked among the leading mathematicians of his time. He was a member of the Royal Societies of London, Berlin, and Paris. The *Philosophical Transactions* of London are enriched by many contributions from his pen; and he was so esteemed by the Royal Society, that they judged him a fit person to decide the famous contest between Newton and Leibnitz for the merit of the invention of fluxions. Among his published works are *Miscellanea Analytica de Seriebus et Quadratis*, &c. (1730, 4to); a work on *The Doctrine of Chances* (1718 and 1738), dedicated to Sir Isaac Newton; and another on *Life Annuities* (3d edit. 1750). D.'s name is well known from its association with a useful trigonometrical formula—viz., that whatever be the index $n$, $\cos n\theta + \sqrt{-1} \sin n\theta$ is a value of $(\cos \theta + \sqrt{-1} \sin \theta)^n$.

**DEMOLI'TION**, in Military Operations, is one of the destructive parts of the duty intrusted to the engineers. When works and buildings belonging to the enemy are to be destroyed, to facilitate operations on the one side, or to obstruct on the other, rules are laid down by which the demolition may be most easily and quickly effected. The quantity of gunpowder to be blasted for bringing down masonry of a particular thickness, the determination of the line of least resistance—these, and similar matters, are required to be studied by officers of the engineer corps.

**DEMO'NIACS** (*dæmoniaci*, *obsessi*, or, with reference to the supposed influence of the moon, *lunatici*), the name given by the Jews to persons afflicted with epilepsy, hypochondria, or insanity, diseases of frequent occurrence in the East. The name originated in the belief, that persons so afflicted had been taken possession of by Evil Spirits or Demons (q. v.). It was a prevalent opinion among the Persians, Greeks, Romans, and the ancients generally, that the extraordinary conditions and actions of men, which could not be referred to the known and apparent operations and powers of the mind, must be ascribed to the influence of one or more higher spirits. This belief is found in Homer, Herodotus, Euripides, and later writers, and also rooted itself very deeply in the Christian mind during the middle ages. As the *good*, when beyond the limits of the ordinary powers or faculties of great men, was attributed to the inspiration of the Muses, or to the direct co-operation, or even incarnation in their persons of some beneficent deity, so also that deep internal unhappiness of 'a mind diseased,' which no strength of will, and no physician's art in olden times could remove, was as unhesitatingly attributed to evil spirits, or *demons*, as the later Jews, probably with an oblique reference to paganism, called them. Spells and exorcisms, in consequence, took the place of the healing art in reference to such as were supposed to be demonised, and the Jewish exorcists (demon-banishers) alleged, according to Josephus, that they possessed the necessary magic formulas, wonder-working roots, &c., which had been handed down from antiquity. The good spirits thus appeared—in harmony with the idea that healing was a thing natural and divine in itself, the normal action, so to speak, of nature—to fulfil their function in banishing and destroying the demons. Thus, Christ appears in the synoptic Gospels as healing many who were possessed of unclean spirits, casting out devils, &c. But apart from the fact, that a belief in demoniacal possession was more vital and universal among the later Jews than among the other nations, on account of their being more deeply penetrated by the consciousness of sin, and by a conviction of the mysterious connection between evil and Satan, it was also expected of the Messiah, the Anointed of God, that he would possess 'power' over demons. This fundamental national belief would unconsciously prepare the contemporaries of Christ for regarding his divine exercise of the physician's art from a *religious* rather than a *scientific* point of view. When they beheld the miraculous effects of his 'power' on the bodies and spirits of the so-called demoniacs, it was natural that they should speak of it in language intelligible to their age, and in harmony with its general notions. To have used other words from the stand-point of a higher scientific knowledge, would have been as confusing to the Jews and earliest Christians as it would have been to assure them that it was the *earth*, and not the *sun*, which stood still during the battle at Gibeon. Besides, when it is remembered that before even the synoptic Gospels were written, the miraculous incidents in Christ's life must have fixed themselves in the memory of the populace, under the conditions of the popular belief, it is difficult to see that there was any other course open to the evangelical historians, even if they did not share the common belief of their countrymen, than to adopt the current representations. They had no interest in the mere scientific accuracy or inaccuracy of such representations. Their object was different and higher: it was to shew the power, wisdom, and goodness of the Saviour, qualities which are equally manifest whichever theory may be adopted. This view of the question, which is held to be in conformity with sound science and sound criticism, presents itself almost irresistibly to the candid and impartial student of the Bible, when he bears in mind that there is nothing in the recorded examples of demoniacal possession different from the ordinary symptoms of epilepsy, hypochondria, and insanity, which are not *now* beyond the physician's skill.

**DE'MONS** (Gr. *daimŏnes*, Lat. *genii*) are, according to superstitious belief, spirits which exercise an influence on the fortunes of men. Their dignity and character have both changed greatly in the course of time. Homer calls the *gods* demons, and *daimoniakos* is with him equivalent to *divine*. Hesiod affirms that there are in the air 30,000 demons or ministering spirits, who were the souls of men in the Golden Age; but a proper classification of these is first found in the Pythagorean and Neo-Platonic systems. Aristotle separates the immortals into gods and demons; mortals, into heroes and men. Plato, from whom Aristotle probably received the hint of his division, says in his *Symposium* that 'the demon is a middle intelligence between God and man, and the uniting link which completes the chain of being.' In other places, he informs us that they inhabit the air, wander through the sky, hover over the stars, and tarry on the earth. They also see the hidden issues of the future, and can alter them at their pleasure. Every mortal receives at his birth a particular demon, who accompanies him to the end of his life, and bears his soul to the place of purification and punishment. In general, it may be said, that the Greeks included the divinity or deity among the demons, in so far as he arranged and disposed the dissimilar fortunes of men. In reference to the actions ascribed to them, the demons were divided into *good* and *bad*—*agathodaimones* and *kakodaimones*. These evil demons were not, however, originally supposed to be hostile to the divinity or supreme demon. They came from him, and carried out his purpose as truly as the good demons. This was precisely the belief of the earlier Jews also, as we find, for example, from the history of Saul, into whom God repeatedly sent an 'evil spirit,' i.e., a demon, in the classical and not in the medieval sense of the term. The demonism of the Romans consisted chiefly in the worship of departed spirits. See MANES, LARES, and PENATES. The origin of the doctrine of demons is to be sought for in the East. In the teaching of the Hindus, who, besides the highest Deity, Brahma, recognise a countless number of divine agents or messengers, the demons are called *deitjas*. In Parseeism, or the religion of Zoroaster, however, this doctrine is found in its most systematic and elaborate development. Indeed, the Persians and Jews *alone* among the nations of the Old World had the conception of evil spirits headed by a chief demon, a Satan, who was over them as a god. To the genii or demons in the kingdom of Ormuzd (Light), who are called *Izeds*, stand opposed the genii in the kingdom of Ahriman (Darkness), who are called Dews. According to the belief of the Egyptians, the circuit of the world (the sea, the earth, the air) was filled with demons, who ruled the elements, exercised mysterious influence over stones, metals, and plants, and had the souls of men in their power. Although demonism came to Greece from various countries, and by various channels, yet the principal source of it was Egypt. The Jews derived theirs—at least to a great extent—directly from the Persians, during the time of the Babylonish captivity; and although acquainted with 'angels' from an early period, angelology, beyond all question, first received elaborate treatment after the return from exile. The dualism which characterises the system of Zoroaster now made itself conspicuous here. According to the Jewish demonology, there were seven good demons who formed the council of Jehovah, and ever stood before his throne, while the evil demons have at their head Satan or Asmodi. After the Jews had, under the Seleucidæ and Ptolemies, entered into extensive commercial relations with the Egyptians and Greeks, especially in Alexandria, Græco-Egyptian conceptions were associated with those derived from Persia. When Christ made his appearance in the world, the Jewish conception of a demon as an 'evil spirit,' *not* from God, had become definitely fixed and popular. This narrowing of the application of the word may have partly originated in the wish to glorify Judaism at the expense of paganism. It would gratify the national pride, which was strongest when it had least to boast of, to include the *demons*, i. e., the spirits both good and bad, of all the surrounding Greek-speaking nations, in one black category, and so make them stand as the representatives of Evil. The early Christian writers carried out this tendency to perfection; for instead of denying the existence of the heathen gods, they turned them into demons, who, acting under the inspiration of their wicked master, had cheated the souls of men, and so made them also worship Satan unawares. See DEVIL. The doctrine of the early church concerning the fall of the demons, based on Genesis vi. 2, and concerning their activity, is a mixture of Jewish and Platonic notions, Christianised, however, by the belief that all their action is controlled and directed by God. Among the Germanic races, during the middle ages, the idea of a person's being taken possession of by demons, led to the other idea of a covenant with the devil, of which the legend of Faust is a well-known example. See Ukert, *Über Dämonen, Heroen und Genien* (Leip. 1850).

**DEMONSTRA'TION** (Lat. *demonstrare*, to point out, to cause to see), in Mathematics, is a proof of any proposition which excludes doubt; such are the demonstrations of the propositions in Euclid's *Elements*. The method of demonstration in mathematics is the same with that of drawing conclusions from principles in logic, and is usually syllogistic, the premises being omitted to be stated at each turn. The principle of *reductio ad absurdum* is also employed. See REASONING, SYLLOGISM.

**DEMONSTRATION**, in Military Operations, is an apparent movement or manœuvre, the chief object of which is to deceive the enemy, and induce him to divide his force, as if to meet dangers from various quarters. When thus divided and weakened, he may be attacked with greater chance of success.

**DEMO'NTÉ**, a town in the south-west of Piedmont, Northern Italy, situated on the Stura, 15 miles south-west of Coni. Pop. 6956.

**DE MO'RGAN,** AUGUSTUS, was born in 1806, in the small Indian island of Madura, on the north-east coast of Java. His father was an officer in the British army. He was educated at Trinity College, Cambridge, and took his degree of B.A. in 1827, when he was fourth wrangler. He was appointed first Professor of Mathematics in the University College, London, after its foundation in 1828. In 1831, he resigned this office, but was reappointed in 1836, and has continued in that capacity ever since. His writings are very numerous. Besides being a mathematician of the first order, he is extensively and minutely versed in the history of the mathematical and physical sciences. He has also devoted himself to the development of the Aristotelian or 'Formal' Logic, to which he has given so symbolical a shape as to make it seem like a branch of Algebra. He has written likewise on the calculation of Insurances and on the Decimal Coinage. The following are the titles of a few of his works: *Elements of Arithmetic* (1830); *Elements of Algebra, preliminary to the Differential Calculus* (1835); *Elements of Trigonometry and Trigonometrical Analysis, preliminary to the Differential Calculus* (1837); *Essay on Probabilities, and on their Application to Life Contingencies and Insurance Offices* (1838); *Formal Logic, or the Calculus of Inference necessary and probable* (1847); *Arithmetical Books, from the Invention of Printing to the Present Time, being brief notices of a large number of works drawn up from actual inspection* (1847). De M. is also the author of the treatises on the Differential and Integral Calculus, published by the Society for the Diffusion of Useful Knowledge; and was one of the most extensive contributors to the *Penny Cyclopædia.*

**DEMO'STHENES,** the greatest orator of Greece, and indeed of the ancient world, was a native of Athens. The date of his birth is doubtful. Fynes Clinton assigns it to the year 382 B.C.; Thirlwall and other good authorities, to the year 385 B.C. His father, a wealthy manufacturer, died early, leaving his fortune and children to the care of three guardians, who cruelly abused their trust. As soon as D. came of age, he resolved to prosecute at law these unfaithful stewards. He gained his case, but much of the property had been already squandered, and he only recovered enough to save him from poverty. His success in this and some other civil causes fixed his resolution to devote himself to public life; and he set himself to master the law and politics of his country with a labour and perseverance almost without a parallel. His first care was to conquer the physical disadvantages under which he laboured. His health was naturally feeble, his voice harsh and tuneless, and his action ungraceful. To strengthen his lungs, he used to climb steep hills, reciting as he went, or declaim on the shores of the sea in stormy weather. To improve his delivery, he took instructions from Satyrus the actor, and did not even disdain to study effects before a mirror. His feebleness of health he never fairly overcame, but he obviated the defects of his early training by the severest study pursued for months at a time without an interruption.

D. first began to take part in public affairs in the 106th Olympiad, when he was between 27 and 30 years of age, and from that time till his death, his history is the history of Athens. The states of Greece were at this time miserably weak and divided, and had recklessly shut their eyes to the dangerous encroachments which Philip of Macedon was even now making on their common liberties. The first period of D.'s public life (extending over ten years from 356 B.C.) was spent in warning his countrymen to abate their mutual jealousies, and unite their forces against the common enemy, whose crafty and grasping policy he exposed so nobly in 352 B.C. in the oration known as the First Philippic. Three years later, Philip became master of Olynthus, the last outpost of Athenian power in the north, which, in a series of splendid harangues—the three Olynthiacs—D. had implored his countrymen to defend. Peace was now necessary for Athens; and D. was among the ambassadors sent to negotiate with the conqueror; but Macedonian gold had done its work, and D., as incorruptible as he was eloquent, saw with despair that Philip was allowed to seize Thermopylæ, the key of Greece, and become a member of the Amphictyonic League. The peace lasted for six years, during which Philip's incessant intrigues were exposed and denounced by D. in orations hardly less remarkable for their political wisdom than for their matchless eloquence. The most important of these were the Second, Third, and Fourth Philippics; and the speeches on the 'Misconducted Embassy,' and 'The Affairs of the Chersonese.' When war broke out in 340 B.C., D. introduced several important reforms into the army and navy, and shewed such powers of vigorous administration, that Philip was baffled for a time. The struggle was closed in 338 B.C. by the battle of Chæroneia, which laid Greece prostrate at the feet of the Macedonians. Only once after that event did D. appear on the scene of his previous triumphs. But on that occasion he delivered, in defence of his friend Ctesiphon, his oration 'For the Crown,' which the almost unanimous verdict of critics has pronounced to be the most perfect master-piece of oratory that ancient or modern times have seen. Æschines, his life-long enemy, against whom this speech was delivered, was so overwhelmed by it, that he quitted Athens, and spent the remainder of his life in exile. In 324 B.C., D. was accused of taking part in a revolt against the Macedonian domination, and thrown into prison, whence he escaped, and fled into exile. The death of Alexander the Great in the following year brought a gleam of hope and sunshine to the Athenians; and D., recalled from exile, was again at the head of affairs. Once more the power of Macedon prevailed. D. was demanded up by the conquerors. Finding escape impossible, the hunted orator sought an asylum in the temple of Neptune, in the island of Calaurea. Before his pursuers overtook him, he had died, as was generally believed, of poison administered by his own hand. His death took place in 322 B.C.

The personal character of D. is one which it is scarcely possible either to praise or to admire too much. His dauntless bravery, the stainless purity of his public and private life, his splendid and disinterested patriotism, and his services as a statesman and administrator, entitle him to a place among the highest and noblest men of antiquity. On his merits as an orator, it is hardly necessary to dwell. Suffice it to say, that the intelligent of all ages subsequent to his own have, with scarcely a dissentient voice, assigned to him the highest place. Homer is not more clearly the prince of ancient poets, than is D. the prince of ancient orators. —The best of the earlier editions of D. are those of Taylor and Reiske, both now superseded by the more recent edition of Bekker. For a detailed analysis of D.'s style, see Lord Brougham's *Dissertation on the Eloquence of the Ancients.*

**DEMO'TIC ALPHABET.** See HIEROGLYPHICS.

**DEMO'TICA,** a town of European Turkey, in the province of Roumelia, 22 miles south of Adrianople. It is situated on the Maritza, here navigable for small vessels, and is defended by a citadel. It contains an old palace, is the seat of a Greek bishop, and has manufactures of silks, woollens, and pottery. Pop. 8000. Charles XII. of Sweden, who, after the battle of Pultowa, first found a refuge at Bender, afterwards removed to D., where he remained for some time.

**DE'MPSTER**, Thomas, a professor famous for his learning, and a miscellaneous and voluminous writer, was born at Muiresk, in Aberdeenshire, about the year 1579. What the rank or condition of his family was, is unknown; we know, however, that he studied at Cambridge, and that when he went to France, which he did while yet young, in order to perfect his education, he represented himself as a man of family, and as the possessor of an estate. At Paris, he obtained a professorship in the college of Beauvais, where he manifested a very quarrelsome temper, engaging, it is said, almost daily in some brawl. One of these unseemly disturbances resulted in D.'s having to retreat to England. To France, however, he again returned, bringing with him a wife, whom he had married while in England, and who was very beautiful. Crossing the Alps, he obtained a second professorship at Pisa, drawing a handsome salary for his labours. Here, however, the infidelities of his wife marred his peace; and he removed to Bologna, where he became professor of *belles lettres*, and where his wife completed her shame by eloping with 'one or more' of his students. Poor D. seems to have been fond of this wanton, for he took the trouble of attempting the capture of the fugitives. He failed; and died at Butri, near Bologna, 6th September 1625.

D. is the author of numerous treatises, among which may be mentioned the *Historia Ecclesiastica Gentis Scotorum*—a work in which his desire to magnify the merits of his country often induced him to forge the names of persons and books that never existed, and to unscrupulously claim as Scotchmen, writers whose birthplace was doubtful, or who were known to be natives of England, Wales, Ireland, and even France and Germany; but nevertheless, in spite of its defects, it is justly reckoned a valuable and erudite performance. It was reprinted for the Bannatyne Club in 1829.

**DEMU'LCENTS** (Lat. *demulceo*, I soften), bland and lubricating liquid substances, taken by the mouth, for the purpose of soothing irritation of the mucous membranes, and promoting the dilution of the blood, and the increase of the secretions. Demulcents are chiefly composed of Starch (q. v.), or Gum (q. v.), or of substances containing these, dissolved in water; sometimes also of oily matters, or the white of eggs, and other albuminous or gelatinous substances largely diluted. The decoction of althæa, or marsh-mallow, is a favourite form of demulcent.

**DEMU'RRAGE**, in the law-merchant, is an allowance made to the master or owners of a ship, by the freighter, when she is detained in port by the latter beyond the specified time of sailing, for his own convenience. A certain number of days, called running or working days, are allowed for receiving and discharging cargo, and it is usually stipulated in charter-parties that the freighter may detain the vessel, either for a specified time, or as long as he pleases, on paying so much *per diem* for overtime. All the ordinary causes of detention, such as port-regulations, the crowded state of the harbour, and the like, are at the risk of the freighter, and demurrage must be paid, though it be proved that the delay was inevitable by him (*Commentaries*, V. i. 431, Shaw's ed.). 'In short,' says Mr Bell, 'the rule is, that during the loading or unloading of the ship, the merchant runs all the risk of interruptions from necessary or accidental causes; while the ship-owners have the risk of all interruptions from the moment the loading or unloading is completed.' But demurrage is not due where the delay arose from detention of the ship by a public enemy, or from hostile occupation of the port; and it cannot, of course, be claimed where the fault lay with the owners themselves, or the master, or crew of the vessel. The demurrage ceases as soon as the vessel is cleared for sailing, though she should be prevented from actually doing so by adverse winds. When the days of demurrage are limited by special contract, and the ship is detained beyond them, the sum due as demurrage under the contract will be taken as the measure of the loss for the further time which may be claimed in the form of damages. It will be open, however, to both parties to shew, that the rate thus fixed *per diem* is either too high or too low. Where there is no stipulation beyond the ordinary agreement that the usual time shall be allowed for loading and unloading, the master will be entitled, when this period expires, either to sail or to claim damage for detention.

**DEMU'RRER**, in English Law, is an exception by one party in a suit or action to the sufficiency in point of law of the case of the opposite party. Demurrers are in use in common law and in equity. *At common law*, each party may demur to the sufficiency of the pleading of the opposite party. The party whose pleading is demurred to may either amend or put in a joinder in demurrer. Before argument, the pleadings are prepared in a particular form, called the Demurrer-book. *A demurrer in equity*, like a demurrer in law, admits the facts of the case, but states objections to the form of the bill in equity (q. v.), or the sufficiency of the plaintiff's case therein disclosed, to sustain the remedy craved. It is a pleading the use of which is confined to the defendant.

*Demurrer to evidence* is also a form of procedure existing in both common law and equity practice. In the former courts, it is, however, almost obsolete; and in its place is substituted a motion for a new trial (q. v.). It may arise on a trial at bar or at Nisi Prius (q. v.). It admits the facts proved, but objects that they are not sufficient to sustain the issue. In equity, a demurrer to evidence is where a witness refuses to answer a question put to him by direction of the court. The objection is then taken down in writing, and is argued before the judge by whom the interrogatories were settled.

*Demurrer to a criminal indictment* is also almost obsolete. After the passing of 7 Geo. IV. c. 64, this form of demurrer, which was formerly of little moment, became of consequence to a prisoner, inasmuch as by neglecting to state in the form of a demurrer his objection to an indictment, he was precluded from afterwards insisting in them. But by 14 and 15 Vict. c. 100, it is enacted that no indictment shall for any of these defects be held insufficient; and further, that every objection for any formal defect in an indictment shall be taken before the jury is sworn, and may be amended by the judge. This last provision places demurrers in criminal cases on a similar footing to that of objections to the indictment in Scotland. There is, however, this material difference, that in Scotland the defect cannot be immediately remedied, but the prisoner, if the objection be sustained, undergoes a further detention in jail on a new indictment.

**DEMY'**, a particular size of paper. In that of printing-paper, each sheet measures 22 inches by 17½; drawing-paper, 22 by 17; and writing-paper, 22 by 15½.

**DENAIN**, a town of France, in the department of Nord, on the left bank of the Scheldt, about five miles west of Valenciennes. Its situation, in the centre of an extensive coal-field, and in the immediate vicinity of iron mines, gives it unusual facilities for smelting iron, and its works of this kind are of considerable importance. D. is a regular and well-built town, and has a good market. It has some manufactures of beet-root sugar. Pop. 8714. Here the allies under Lord Albemarle were defeated by the French under Maréchal de Villars, 24th July 1712.

**DENA'RIUS** (*deni*, ten each), the principal silver coin among the Romans, was equal to ten *ases*, but upon the reduction of the *as*, the denarius equalled sixteen of it. It was first coined 269 B.C. Its weight at the end of the Roman Commonwealth is estimated at 60 grains, while under the Empire the weight was 52·5 grains of silver. The value of the Commonwealth denarius was thus rather more than 8½*d*., and of the later period about 7½*d*.

Denarius of the earliest kind:
Having on the obverse a personification of *Rome* as a warrior with helmet; and on the reverse, a chariot drawn by four horses.

**DE'NARY SCALE.** See NOTATION.

**DE'NBIGH**, a parliamentary and municipal borough, the county town of Denbighshire, in the north of the county, 30 miles west of Chester, and 213 miles north-west of London. It stands in the hundred of Isaled, near the middle of the vale of the Clwyd, on the sides and at the bottom of a rugged steep limestone-hill, crowned by the imposing ruins of a castle built in 1284 by Henry Lacy, Earl of Lincoln, where there had stood fortifications erected by William the Conqueror, and where there are traces of still earlier castellated remains. The newer part of D. was built at the bottom of the hill, after the destruction and desertion of a great part of the town on the top of the hill, about 1550. D. has manufactures of shoes, and leather for the English markets and export trade; but it is more a place of genteel retirement than commerce. Pop. of parish in 1861, 4054. It sends one member to parliament; Ruthin, Holt, and Wrexham being contributory boroughs. In 1645, Charles I. took refuge in the castle after the battle of Rowton Heath. The garrison surrendered to the parliamentary forces, after a siege of two months. It was shortly afterwards dismantled. The fortifications have an area of a square mile in extent. A lunatic asylum for the five counties of North Wales was erected near the town in 1848. A noble institution for the maintenance and education of 50 female inmates, of whom 25 are orphans, was built in the town, and opened in 1860, with funds in the hands of the Drapers' Company of London, from money left to them in 1540 by one Thomas Howell, a Welshman. It has an endowment of about £1500 a year. The charter of Henry de Lacy is preserved among the corporate archives.

**DE'NBIGHSHIRE**, a county of North Wales, on the Irish Sea, and between the Dee and the Conway. It is 41 miles long, with an average breadth of 17; contains 603 square miles, has 8 miles of coast, and is the sixth in size of the Welsh counties. The surface is partly rugged and mountainous, with some beautiful and fertile vales, as the vale of the Clwyd, 20 miles by 7. In the north, is a horse-shoe range of hills, 65 miles long, and convex to the coast. The highest hill is Cader Fromwen, 2563 feet; and many others rise above 1500 feet. The rocks are chiefly Silurian clay and graywacke slates, with some granite and trap, and bands of Devonian, Carboniferous, and Permian strata. There occur coal, iron, slates, flags, millstones, limestone, lead, and copper. The chief rivers are the Dee, Conway, Elwy, and Clwyd. The Rhaiadr waterfall is 200 feet high in two parts. Llangollen vale is famed for romantic beauty and verdure, amid hills of savage grandeur. The climate is mild in the lower parts, but cold and bleak among the hills, where small hardy sheep and ponies are reared. Nearly a third of D. is arable, and is highly cultivated; its corn, cheese, butter, and livestock are greatly esteemed. It is also well timbered. Salmon are caught in the rivers. D. is divided into 6 hundreds, 3 poor-law unions, and 64 parishes, in the diocese of Bangor and St Asaph. The chief towns are Denbigh, Wrexham, Ruthin, Holt, Llangollen, Llanrwst, Abergele, and Ruabon. In 1861, pop. 100,862; churches, 341 (Methodists, 171; Church of England, 76). D. returns three members to parliament, two for the county, and one for Denbigh. D. was anciently occupied by the Ordovices, a powerful tribe, not entirely subdued by the Romans till the time of Agricola. Of British or pre-Roman remains there still exist tumuli, two cistvaens or stone cells, barrows, and forts. To the times of the Welsh and Saxon struggles are referable the Pillar of Eliseg, near Llangollen, and the dikes of Offa and Watt. Offa's, the king of Mercia's dike, to keep out the Welsh, was a ditch, with small forts on mounds at intervals, and ran from Herefordshire to the estuary of the Dee; Watt's dike ran on the east side of Offa's dike, and parallel to it. Wrexham Church is one of the seven wonders of Wales. Chirk Castle is a fine Norman stronghold, lately restored.

**DE'NDERAH** (Gr. *Tentyra*, Coptic *Tentore*, probably from *Tëi-n-Athor*, the abode of Athor), a ruined town of Upper Egypt, situated near the left bank of the Nile, in lat. 26° 13′ N., long. 32° 40′ E. It is celebrated on account of its temple, dating from the period of Cleopatra and the earlier Roman emperors, and one of the finest and best preserved structures of the kind in Egypt. The principal temple measures 220 feet in length by about 50 in breadth, and has a noble portico supported on 24 columns. The walls, columns, &c., are covered with figures and hieroglyphics. Prominent among the former is that of Athor or Aphrodite, to whom the temple was dedicated. On the ceiling of the portico are numerous mythological figures arranged in zodiacal fashion, and which were long regarded as a representation of the zodiac; but the absence of the crab has led some recent archæological travellers to doubt whether the figures were intended to have any reference to astronomy. There are many other sacred buildings at D., including a temple of Isis. The whole, with the exception of one propylon, are surrounded by a sun-dried brick-wall, 1000 feet long on one side, and in some parts 35 feet high.

**DE'NDERMONDE** (Belg. *Termonde*), a town of Belgium, in the province of East Flanders, situated at the confluence of the Dender and the Scheldt, 18 miles east of Ghent. D., which is said to have originated in the 8th c., is fortified, and has a citadel dating from 1584, and possessing the means of laying the surrounding country under water in case of attack. Louis XIV. besieged it in vain in 1667, but Marlborough, aided by a long drought, succeeded in taking it in 1706. [In connection with

Marlborough's siege, D. is mentioned frequently in Sterne's *Tristram Shandy*.] The principal buildings of D. are the town-house and several churches, the most noteworthy of which is the church of Notre Dame, a very old edifice, containing two admired pictures by Vandyk. The manufactures are woollens, lace, cotton-yarn, &c., and there is a large weekly market for the disposal of the agricultural produce of the neighbourhood. Pop. 8700.

**DENDRE'RPETON**, a small lizard-like batrachian, found by Lyell and Dawson in the interior of the hollow trunk of an upright *sigillaria* in Nova Scotia. The tree was about two feet in diameter, and consisted of an external cylinder of coal, and an internal axis of mud and sand, cemented together with fragments of wood into a solid rocky mass. In this were discovered the shell of a *pupa*, the first air-breathing mollusc met with in the coal, and the bones of a small reptile probably 2½ feet long. It was described and figured by Owen as *D. Acadianum.* He shewed it to be nearly related to *Archegosaurus*, from the plicated structure of the teeth, the sculpturing of the broad cranial plates, and the structure and proportion of certain limb-bones. It received its name, 'tree-lizard,' from its having been found in a tree; and this was supposed to shew that it had arboreal habits: it is, however, probable that the remains had been washed in with the mud and sand which form the matrix in which they are preserved.

**DE'NDRITE**, the name given to a peculiar branching mineral crystallisation on the surfaces of the fissures and joints, or in the substance of rocks, having the appearance of moss, and often mistaken for fossil plants. The hydrous oxide of manganese is the mineral that generally assumes this form, occurring frequently in great abundance in limestone, steatite, trachyte, and other substances.

**DE'NDROLITES**, petrified stems of trees or shrubs, which occur in all parts of the world in the formations called Secondary, especially in the Coal formation. They may be regarded as the remains of a former creation. They are of very various magnitude. In some places, gigantic stems are found, and these are often observed to have branches, fruit, and even leaves—these, however, only as impressions—whilst in other places only fragments occur, which, however, belong to trees having nothing in common with those now growing in the same regions—as, for example, beautiful stems of palms at Chemnitz in Saxony, &c. Such woods are generally changed into agate, or into pitchstone, when they occur in ancient strata altered by volcanic fire. Concerning the question of their origin, opinions are still divided. Many of them are so hard and beautifully coloured, that they are cut and employed for all artistic purposes. When cut into very thin plates, they exhibit under the microscope the structure of the wood so perfectly, that it is not only possible for botanists to determine the natural order or family of plants to which it belongs, but even the genus and species. They mostly belong to the *Filices*, *Cycadeæ*, and *Coniferæ*. Brongniart was amongst the first investigators of this department of science. He has had many followers, amongst whom, in our own day, Unger and Göppert have especially distinguished themselves. See Göppert, *Monographie der fossilen Koniferen* (Leyden, 1850).

**DE'NDROPHIS** (Gr. tree-snake), a genus of serpents of the family *Colubridæ*, remarkable for their extremely slender form, their beautiful colours, and the liveliness of their movements. Their eyes are very large and prominent. They are widely distributed over the warm parts of the world; none are found in Europe. They live chiefly among the branches of trees, and insects are their principal food.

**DENGUE**, or **BREAK-BONE FEVER**, also called DANDY and BUCKET FEVER, is a disease known in the southern states of North America and in the West Indies, where it was first described as having appeared in the years 1827 and 1828. It was very violent in its access, but not often fatal, and consisted chiefly of a severe attack of inflammatory fever, with great heat and redness of the surface, and well-marked rheumatic pains of the limbs both in the joints and muscles. It usually terminated by a copious perspiration after a few days.

**DENHAM**, SIR JOHN, an English poet of the reign of Charles I., was the son of the Chief Baron of Exchequer in Ireland, and was born at Dublin in 1615. In 1631, he entered Trinity College, Cambridge, where, after studying three years, he took his degree. Turning his attention to literature, he wrote a tragedy, entitled *Sophy*, which in 1641 was acted with great applause at Blackfriars. Two years after, he produced the poem *Cooper's Hill*, which has done more to perpetuate his name than any other of his works. In 1647, he was engaged in the performance of secret services for Charles I.; but these being discovered, he was obliged to escape to France in 1648, returning thence to England in 1652. After the Restoration, he was appointed surveyor-general of his majesty's buildings, and created Knight of the Bath. Towards the close of his life, the latter part of which was darkened by an unfortunate marriage, he was visited by insanity; but recovering for a short time, he commemorated the death of Cowley in one of his happiest poetical performances. His own death occurred in 1668. His verse is characterised by considerable smoothness and ingenuity of rhythm, with here and there a passage of some force.

**DENI'NA**, CARLO GIOVANNI MARIA, an Italian author, was born 28th February 1731, at Revello, in Piedmont; studied at Turin, and in 1754 was appointed Humanity Professor at Pignerolo, but was deprived of his office on account of his having written a comedy in which there was much that excited the professional animosity of the ecclesiastical order. D. went to Milan, but was soon after recalled to Piedmont, and appointed Professor of Rhetoric in the university of Turin. In 1777, he published anonymously at Florence his *Discorso sull' Impiego delle Persone*, in which he sought to shew how monks might be transformed into useful members of society. This, of course, again cost him his chair, and he was even banished from the metropolis. In 1782, he went to Berlin, on the invitation of Frederick the Great. Here he lived for many years, and wrote a considerable number of works. In 1804, he was introduced to Napoleon at Mentz, to whom he dedicated his *Clef des Langues* (Ber. 1804), and was in consequence appointed imperial librarian at Paris, where he died 5th December 1813.—D.'s principal productions are—*Discorso sopra le Vicende della Letteratura* (2 vols., Turin, 1761), *Delle Rivoluzioni d'Italia* (3 vols., Turin, 1769—1770), an excellent work, which was copiously abused by the apologists of ecclesiastical privileges; and *Storia Politica e Letteraria della Grecia Libera* (4 vols., Turin, 1781—1782). D.'s other works were, for the most part, written in Prussia. Among them may be mentioned—*Essai sur la Vie et le Regne de Frédéric II.* (Berlin, 1788), *La Prusse Littéraire sous le Regne de Frédéric II.* (3 vols., Berlin, 1790—1791), *Tableau Historique, Statistique et Moral de la Haute Italie et des Alpes* *qui l'entourent* (Turin, 1805), and *Storia dell' Italia Occidentale* (6 vols., Turin, 1809—1810).

**DENIS**, St, according to tradition, the apostle of France and first Bishop of Paris, suffered martyrdom in the 3d century. He was sent (as is said) from Rome about 250 A. D. to preach the gospel to the Gauls. After various detentions at Arles and other places, he arrived in Paris, where he made numerous proselytes. Pescennius or Sicinnius Lescennius, who was then the Roman governor of this part of Gaul, ordered D. to be brought before him, along with other two Christians, Rusticus, a priest, and Eleutheros, a deacon. As they continued firm in their faith, in spite of threats, Pescennius caused them to be cruelly tortured, and afterwards beheaded, 272 A. D., or, as others say, 290 A. D. Gregory of Tours, Fortunatus, and the Latin martyrologists, state that the bodies of the three martyrs were thrown into the Seine, but taken up by a pious woman named Catulla, and interred near where they lost their lives. At a later period, a chapel was built over their tomb. In 636, King Dagobert founded on the spot an abbey, called St Denis, which soon grew to be one of the richest and most important in the whole kingdom, and was long the sepulchre of the French kings. What measure of truth there may be in the above biography, it is impossible to say. The Acts of St D., written about the end of the 7th or beginning of the 8th c., is founded merely upon vulgar traditions, and is full of absurdities. The Greek Church makes St D. to be the same person as Dionysius, the Areopagite, first Bishop of Athens. The Roman Catholic Church celebrates his memory on the 9th of October. For a long period his name was the war-cry of the French soldiers, who charged or rallied to the words *Montjoye St Denis.*

**DENIS**, St, a town of France in the department of Seine, six miles north of Paris. It is traversed by two small streams, the Croud and Rouillon, and is well built, with clean spacious streets. It is situated within the line of forts forming the outworks of the fortifications of Paris, and was itself formerly fortified, but its ramparts have been converted into promenades. St D. has manufactures of printed calicoes and other cotton goods; also several flour-mills, dye-works, bleacheries, and chemical works. Its yearly market, at which there is an annual sale of about 180,000 sheep, is one of the oldest in France, and lasts for a fortnight. Pop. 14,155. The town is supposed by some to date from the foundation of a chapel raised above the tomb of St Denis (q. v.). This chapel was replaced, some time after his death, by a church and abbey, built by Dagobert I., who was buried in the abbey church, which thereafter became the mausoleum of the kings of France. By a decree of the National Convention in 1793, the abbey was ordered to be destroyed, and in three days 51 tombs were sacrilegiously rifled and demolished, and the bodies cast indiscriminately into ditches prepared for them. The building, stripped of its lead to furnish bullets for the revolutionists, remained roofless, and was used as a cattle-market, until the time of the Empire, when Napoleon commenced its restoration, a work which was completed by succeeding governments, in a style surpassing even its former splendour. The crypt of the abbey church contains statues of the French kings and princes from Clovis to Louis XVI.

**DENISON**, John Evelyn, Speaker of the House of Commons, and Privy Councillor, was born in 1800; eldest son of John Denison, Esq., of Ossington, Nottinghamshire. Educated at Christ Church, Oxford; married, 1827, Lady Charlotte, third daughter of the fourth Duke of Portland; represented Newcastle-under-Lyne from July 1823 to 1826, and Hastings from 1826 to 1830; was a Lord of the Admiralty from 1827 to 1828; sat for Notts from 1831—when he was also returned for Liverpool—till December 1832. On the division of the county under the Reform Bill, he was returned for South Notts until 1837. He was then without a seat until 1841, when he was returned for Malton, but exchanged this borough for North Notts in 1857. In May 1857, on the elevation of Mr Shaw Lefevre to the peerage, D. was elected Speaker of the House of Commons without opposition, and re-elected in May 1859. In person he is tall, and his deportment is urbane and dignified. In knowledge of parliamentary practice, however, and the faculty of inspiring confidence in his decisions on points of order, he can hardly be expected to equal his distinguished predecessor.

**DENIZLI'**, a town of Anatolia, Asiatic Turkey, situated on a low hill rising out of a spacious plain, in lat. 37° 48′ N., long. 29° 3′ E. D. is chiefly occupied with bazaars and market-places, the inhabitants for the most part residing in the environs. The manufacture of leather and a kind of morocco forms the staple industry of the place. The population may now amount to 8000 or 10,000; it was formerly much more numerous, but by an earthquake in 1715, no less than 12,000 people perished.

**DE'NMARK** (Dan. *Danmark*), the smallest of the three Scandinavian kingdoms, is situated between 53° 23′ and 57° 44′ 50″ N. lat., and 8° 5′ and 12° 45′ E. long., excepting the small island of Bornholm in the Baltic, about 90 miles east of Seeland, which lies in 15° E. long. D. is bounded on the N. by the Skager Rack, a gulf of the North Sea; on the E. by the Cattegat, the Sound, the Baltic, and Mecklenburg Schwerin; on the S. by the Elbe; and on the W. by the North Sea, which the Danes call the 'Western Ocean.'

The following table gives the main divisions of the kingdom of D. and its principal colonies, with the chief towns, extent, and population of each:

| | Chief Towns. | Area in Eng. sq. miles. | Population in 1858. |
|---|---|---|---|
| Denmark Proper (comprising the islands of Seeland, Fühnen, Laaland, &c., and the peninsula of Jutland), | Copenhagen (capital), Odensee, Aalborg, &c. | 13,600 | 1,500,000 |
| The duchies of Slesvig, Holstein, and Lauenburg, . . . | Slesvig, Altona, Kiel, &c. | 7,300 | 960,000 |
| The Faröe Isles, Iceland, and Greenland, | Thorshavn, Reikjavig, &c. | 42,600 | 80,000 |
| Santa Cruz, St Thomas, and St John, in the West Indies, . . | Christianstad, &c. | 110 | 37,000 |
| | | 63,610 | 2,577,000 |

According to the Danish Official Almanac of 1860, the estimated population for that year is 2,721,000.

The continental portion of D., which comprises Jutland, Slesvig, and Holstein, and is, in point of fact, the north-western extremity of the German continent, has a geographical length from north to south of about 300 miles, while its breadth from east to west varies from about 30 to 100 miles. The entire coast-line of D., from the Elbe along the North Sea, Skager Rack, Cattegat, Sound, Baltic, and Little Belt, exceeds 1100 miles; but many parts of this extended range are entirely unavailable for purposes of maritime intercourse, in consequence of the shallowness of the water, or of the numberless sand-banks, bars, and small islands which skirt the coasts. Seeland, or *Sjælland*, the largest of the islands, and the seat of the metropolis, Copenhagen, has an area of about 2000 square miles. Its surface is in general very flat, and only a few feet above the level of the sea, and the highest of its few isolated elevations is not 500 feet above the sea. The island is generally fertile, and well wooded, more especially in the south, but in the north the soil is in many parts arid. Fühnen, the island next in extent, with an area of about 900 square miles, is divided from Seeland by the Great Belt, and from Jutland by the Little Belt. It is less wooded than Seeland, and is intersected by a range of hills of inconsiderable height. The smaller islands of Laaland, Langeland, Falster, and Moen, with an area of 1200 square miles, are grouped to the south of Fühnen and Seeland, and exhibit the same physical and geological characters. They evidently, at some earlier epoch of the world's history, formed, together with those two larger islands, one connected whole with Jutland on the west, and Sweden on the east. The north-east shores of Sjælland are separated from the latter country by a channel 70 miles in length, and only 1½ mile in breadth at its narrowest point, known as the Sound, or the *Öre Sund*, Ear Sound, so denominated from its resemblance to the human ear. This channel varies from 10 to 19 fathoms in depth. The western coasts of Sjælland are divided from Fühnen by the Great Belt—a channel 9 miles wide at its narrowest point, and from 5 to 25 fathoms in depth—while the western shores of Fühnen are separated from the peninsula of Slesvig and Jutland by the Little Belt, which is about four-fifths of a mile wide. The peninsula of Jutland, whose area is about 8500 square miles, was anciently, and even comparatively recently, covered with forests, but since their wasteful destruction, extensive tracts have become converted into sandy heaths, and in some parts it has been found necessary to sow bent-grass and plant shrubs, in order to prevent the mischief accruing to the cultivated lands by the clouds of dust raised by the wind. Some fine beech and oak forests still remain, and the country is pleasantly diversified with woods and pastures. The Jutlanders are either engaged in a seafaring-life or in agriculture, there being scarcely any manufactures in the peninsula. The pastures are extensive, and good breeds of horned cattle and of horses are raised, and large numbers exported to Germany, Russia, and France. The southern portion of the peninsula, comprising Slesvig, Holstein, and Lauenburg, with an area of 7200 square miles, contains large tracts of marshy land like the fens of Lincoln and Cambridgeshire, but the soil is very rich, and yields excellent crops. Along the entire western shore, from the north of Jutland to the German frontier, the surface is a continued level, and has been redeemed from the sea; it is still exposed to inundation, and hence it is found necessary to protect it by embankments and dikes from further inroads of the ocean, and to drain the fields when under water by wind-mills, as in Holland. These defensive works are under the management of a Board, appointed by government, who prescribe regulations which the local proprietors are obliged to observe. The eastern side of Slesvig and of the islands generally, is skirted by abrupt limestone cliffs known as *klinte*. Jutland is, on the whole, the least fertile part of the peninsula, and the central portions of Holstein and Slesvig the most so. Jutland is an integral portion of the monarchy. The duchy of Slesvig is an appanage of the Danish crown, but distinct from it, and held by the sovereign as the count-duke of the province. Holstein fell to the Danish kings at the same time with Slesvig, but is a fief of the German empire; and Lauenburg was made over to Denmark in 1815, at the congress of Vienna, in lieu of a portion of Pomerania.

The coasts of D., both on the continent and in the islands, are indented with numerous bays or *fjords*, the largest of which is Liim Fjord, which intersects Jutland, and since 1825 has insulated its northern extremity by breaking through the narrow isthmus which had separated it from the North Sea. It covers an area of 250 square miles. D. abounds in small lakes, but as no inland point is more than 30 or 40 miles from the sea, and the ranges of hills low and interrupted, the country has no large rivers. The Elbe, which forms the southern boundary of the duchy of Lauenburg, receives the inconsiderable Danish streams of the Bille, Alster, Stoer, and Delvenau. The largest river of D. is the Eyder, navigable along nearly the whole of its course, of about 150 miles. D. has four large canals—the Slesvig, Holstein, and Kiel Canal, which connects the North Sea with the Baltic, comprising a portion of the Eyder and of Lake Flembude, and terminates in the Kiel Fjord; the Stecknitz Canal, in the duchy of Lauenburg, which unites the Elbe with the Baltic; the Daneskjold Canal, in the island of Seeland; and the Odensee Canal, connecting the capital of Fühnen with the sea. There are three lines of railway in D., viz. from Copenhagen to Corsoer on the Great Belt; from Altona (opposite Hamburg) to Kiel, with various branches; and from Tonningen, across the duchy of Slesvig, to Flensborg. The public roads, along which the mails are carried, are well kept, and are under the management of the royal engineers.

*Climate, Soil, Productions*, &c.—The climate of D. is modified by vicinity to the sea, and is considerably milder, and the air more humid, than in the more southern and continental Germany. The cold is seldom very intense much before Christmas, or after the middle of March. The summers are occasionally very hot; the weather generally may be characterised as very variable; rain and fogs are frequent. The cold is the greatest in the north parts of Jutland, and the least in the adjoining islands. The mean temperature in Copenhagen, whose climate may be regarded as representing an average of that of all D., is, in winter, 32·9; spring, 43·5; summer, 63·5; autumn, 49·3, Fahrenheit. The alternations from winter to summer are rapid, and scarcely broken by the intervention of spring, or the succession of autumn. The soil is productive, and it is estimated that more than half the population of D. are engaged in agricultural pursuits. The cereal crops are generally good; the average annual yield of wheat, rye, barley, buckwheat, and pease, is reckoned at eight and a half millions English quarters. About half this quantity is exported. The production of potatoes has been on the increase of late years. D. produces about one-half of the flax, and three-fourths of the hops which it consumes. In Seeland, where alone fruits and vegetables are cultivated with any special attention, the produce is remarkable rather for quantity than quality. From 20,000 to 25,000 horses are annually exported. Cattle are reared chiefly for the sake of the dairy produce, which constitutes the principal revenue of the farm; sheep are raised for the same purpose, butter being made of their milk. The streams and fjords abound in valuable fish, as cod, herrings, salmon, &c. The fisheries form an essential branch of national industry; the herring-fishery in the Great Belt alone gives an annual produce of 50,000 tons, nearly half of which is exported. Oysters are in Holstein a crown monopoly; seals are captured off Jutland, and their fat converted into oil. The Danes take an active share in the cod-fishing in the North Sea, and the whale-fishing off Greenland. No part of the Danish territories is rich in minerals; some coal is found in the island of Bornholm, gypsum at Segeberg, and salt at Oldesloe. Amber is collected on the western shores of Jutland. Peat is got wherever there are swamps; and from the absence of productive coal-mines, and the increasing scarcity of wood, it is of great value for fuel, and every village in the vicinity of such land has a certain portion assigned for its supply. The crown owns one-fourth of the forest-land of D. Proper and Slesvig. Beech and birch are the prevalent trees, but oak, pine, and larch are also indigenous, and grow to perfection. Agriculture has been steadily improving in D. of late years, but the land is too much subdivided to admit of the expenditure of great capital; and, moreover, is seldom cultivated by the owners. The peasants were freed from serfdom in the last century; but although more educated and enlightened than the same class in most other countries, the dues and services by which they are weighed down prevent their availing themselves largely of modern scientific improvements in the cultivation of their ancestral farms. Still, the condition of the labouring classes is happy; they are more roomily and warmly lodged, and better clad, than in Great Britain, and their dwellings are always clean. The peasants manufacture almost all that they require within their own homes, the women weaving linen and woollen stuffs for the use of the household, and the men making their own furniture and simplest farm-implements, and the wooden shoes which are worn by men, women, and children. The abundance of reeds and rye-straw enables them to have sound thatch on their houses, and to supply themselves with many articles of straw-work. The population of the rural districts is four times greater than that of the towns. Almost two-thirds of the entire area of the country is arable land. The Danes have not hitherto availed themselves of the great natural advantages which the country possesses for manufactures and trade; and notwithstanding the rich clays which afford valuable materials for the manufacture of earthen-ware, and the abundant water-power in every part of the kingdom, the industrial operations are very inconsiderable. There are, however, a few good porcelain and glass works and iron foundries, chiefly in Seeland and near Copenhagen; and of late years the manufacture of ornamental paper has been brought to great excellence at Lilkeborg, near Copenhagen. Linen is the principal article of domestic manufacture in Seeland, but the supply does not suffice for the home-demand. Many of the restrictions which formerly cramped foreign commerce have of late years been removed, but the commercial legislation is still too protective to give free scope to individual enterprise. The following are the principal seaports, and the populations which they were said to contain in 1859: Copenhagen, 150,000; Altona, 32,000; Flensborg, 16,000; Kiel, 15,000; Elsinore and Aarhuus, about 8000—9000; Frederickshavn, Glückstadt, Aalborg, &c., 6000—8000.

*Exports and Imports.*—The principal articles of export are grain, butter, cheese, smoked and salted meats, brandy, liqueurs, horned cattle, horses, skins, hides, tallow, bristles, fish, train and whale oils, eider-down, &c. Among the imports are wines and spirits, salt, drugs, spices, textile fabrics, timber, coal, coffee, tea, tobacco, rice, flax, hemp, &c.

The value of the exports amounted in 1859 to about 27 millions of rix-dollars, or about 3½ millions sterling, and the imports to about 5 millions. About two-thirds of the export trade is carried on in native vessels. The entrances and clearances at the various ports were, in 1858, about 75,000 vessels, of about 2 million tons. The number of Danish mercantile vessels, including freight-steamers, was in the same year about 2500, which, with few exceptions, had been built in Denmark.

*Revenue, &c.*—The estimated revenue for the whole kingdom, including the duchies and dependencies, for the year ending March 1860, was, in round numbers, £2,900,000, and the expenses were estimated at nearly the same sum. The national debt, in 1858, was in round numbers 14 millions sterling, of which 60 per cent. are held in Denmark. The Sound dues, which yielded an important item to the revenue, have been recently abolished, in conformity with an agreement entered into by various mercantile nations to pay to D. a compensation for their abolition. See SOUND DUES.

The monetary system of D. is now placed on a secure basis. The present national bank of D. at Copenhagen, with branches at Aarhuus and Flensborg, was established in 1818. It is authorised to put 20 million rix-dollars in notes in circulation, and must have half that amount in gold and silver, in the current coin of the country, bullion, sovereigns, &c., according to certain fixed proportions, and must hold 150 per cent. securities for the amount of the deposits. The coins in circulation are gold Fredericks d'or (16*s.* 10*d.*), silver specie-dollars (4*s.* 6*d.*), rix-dollar (2*s.* 3*d.*), marks (4½*d.*), and skillings (¼*d.*). The rix-dollar is divided into 6 marks, of 16 skillings each.

*Army, Navy, &c.*—The Danish army, on the peace-footing, amounts nominally to 40,000 men, of which 10,000 are actually on service, and the remainder at the disposal of the crown, when required. The militia numbers about 60,000 rank and file. Since 1807, when Britain deprived D. of the whole of her fleet and all her naval stores, the government has been making strenuous efforts to repair this severe loss, and D. is now in possession of several fine ships of the line, and a well equipped complement of smaller vessels, war-steamers, and gun-boats. The navy is recruited from certain of the maritime districts exempt from the liability of having to supply recruits for the army. The officers of both services are obliged to receive their education in the royal colleges, specially designed for them. The chief fortified ports of D. are Copenhagen, Rendsborg, Glückstadt, and Fredericia; and the principal fortress is Kronborg Castle, near Elsinore.

*Education.*—The educational institutions of D. have reached a very high degree of perfection, and few countries, if any, can compete with her in regard to the excellence of the system, and its extensive application relatively to the amount of the population. All educational institutions are managed by a royal college, or board, consisting of three assessors and a president. It has no superior but the king, to whom it reports directly; and with it rest all appointments in the university of Copenhagen, and all grammar schools in D. Proper. Education is compulsory for children between the ages of 7 and 14 years, and poor parents pay a nominal weekly sum towards the government schools. Confirmation is also compulsory, and certificates of baptism, vaccination, and confirmation are indispensable before entering the public service, the learned professions, or trades, and even before entering on marriage. The university of Copenhagen, which was founded in 1474 by Christian I., has a staff of about 40 professors, besides lecturers and tutors. The average number of students is 1100. There are 130 grammar schools in 64 provincial towns, and 2504 national schools in the rural districts, attended by about 180,000 children, and several seminaries for normal-school teachers. The university of Kiel, and the grammar and other schools in the duchies, are under the control of the respective local authorities.

*Religion.*—The established religion of D. is Lutheran, to which the king must belong; but complete toleration is enjoyed in every part of the kingdom. The reformation was introduced in 1536, when Christian III. caused all the Romish bishops to be seized in one day, when their deposition from their sees was formally proclaimed, and the property of the church incorporated with that of the crown. D. is divided into 7 dioceses, or *stifter*, but it has 9 bishoprics (besides those in the West Indian colonies)—viz., Seeland, Laaland, Fühnen, Ribe, Aarhuus, Viborg, Alsen, Aalborg, and Skalholt in Iceland; 1907 parishes, with numerous affiliated churches, 62 rectors, and 1677 parish ministers. The nomination of the bishops is vested in the king; they have no political character; but in other respects exercise nearly the same privileges within their dioceses as their English brethren of the same rank.

*Law.*—The supreme court of justice holds its sittings at Copenhagen, and there are royal courts in the duchies, and lower courts in the towns. All civil cases are first carried before a Court of Conciliation, composed of persons from the vicinity, selected on account of their position and character. Their decisions are registered, and have legal force where both parties have engaged to abide by the judgment; otherwise, the case is carried to the higher courts. Appeals are allowed from all the lower courts to the Supreme Court.

*Constitution and Government.*—The succession to the crown was not necessarily hereditary till 1660, when the people and the clergy, impelled by hatred towards the nobles, in whose hands the supreme power of the state rested *de facto*, constituted themselves into a national assembly, which invested the sovereign (Frederick III.) for himself and his heirs with absolute power, and declared the succession to the throne hereditary. From that time, the crown exercised the *dominium absolutum*, unchecked by any constitutional restraint, till 1831, when Frederick VI., yielding to the pressure of the times, granted a constitution to his people, and established an assembly of notables for the islands and Jutland, the duchies being governed by their own constitutional forms. The nation was at first perfectly satisfied with the amount of power conceded by the king, but after a time the anomalous character of the powers vested in the assembly were more fully understood; and on the death of Christian VIII., his son and successor, the present king, Frederick VII., saw himself obliged to depart from the conservative policy of his father, and to grant the constitutional form of government which D. now enjoys, and which is based upon the most liberal principles. The people are efficiently represented, and have a voice in all public matters. The press is virtually free, and only answerable to law. The national assembly consists of the Folksthing and Landsthing, and is invested with very extensive powers; it meets annually for two months, but the deputies are elected triennally, and receive a fixed allowance during their sittings. Both branches of the assembly are elective, and although the Landsthing bears some analogy to the English House of Lords in respect to the sphere of its powers, and its position in regard to the Lower House, or Folksthing, its members do not of necessity belong to the aristocratic class. Their number is in the proportion of 1 deputy for every 14,000 of the population. The Holstein-Slesvig differences have, since their outbreak in 1848, been a source of perpetual national disturbance, and have been made the subject of fierce debates in the assembly; indeed, the anomalous position in which D. stands to the duchies, has of late years become a question of European policy; and the failure of direct heirs of the king, or the heir-presumptive, has added to it the still more difficult problem of the settlement of the succession to the crown.

The king's person is inviolable; the ministry is responsible. There are separate ministers for Slesvig, Holstein, and Lauenburg, and the last two provinces, as fiefs of the empire, have separate courts of justice, provincial chambers, and independent forms of local administration. The nobility of the three duchies constitute a distinct body. As Duke of Holstein and Lauenburg, the king has a seat and three votes at the German Diet, where he ranks tenth in order, and is bound to furnish a contingent of 3600 men to the confederate army. The titles of nobility in D. are limited to counts and barons, which were first created by Christian V. in 1670; but the untitled nobility, consisting of the most ancient families in the kingdom, rank higher in public estimation. The several colonies are governed by governors or high bailiffs, nominated by and alone responsible to the crown. The king has a privy-council, in which there are associated with him the heir-apparent and eight members.

*Physical Constitution and Character of the Dane.*—The Dane has a strong and muscular frame, of the middle height; he is generally of a fair complexion, with light hair and blue eyes. He is of an open, unsuspicious disposition, not easily roused to action, prone to let others take advantage of him rather than exert himself to assert his own rights; vain of his native land, disposed to overrate its importance, on the ground of its earlier history; but brave, and capable of great self-sacrifice, when called upon to act in defence of his home and country. The taste and care that are bestowed by all classes, from the humblest to the highest, in tending the graves of the dead, and planting flowers round them, and the love of decoration evinced in the interiors of houses generally, testify to the existence among the Danes of the æsthetical feeling for which their ancestors were distinguished in the palmy-days of Norman supremacy. Copenhagen is the centre of the mental and political activity not only of the entire nation, but also of the neighbouring Scandinavian countries.

*History.*—The Cymri were the earliest known inhabitants of Scandinavia, and made themselves formidable to the Romans 100 years B.C. The next we hear of are the Goths, who, under their mythical leader, Odin, established their rule over the Scandinavian lands. Odin's son, Skjold, is reputed to have been the first ruler of D.; but the little that is known of the Danish history in those remote ages, seems to indicate that the country was split up into many small territories, whose inhabitants lived by piracy. The people were divided into 'Bœnder,' freemen, and 'Trælle,' bondsmen. The former busied themselves with war, and 'Vikingetog,' or piracy, and the government of the land; while to the latter were left the peaceful pursuits of hunting, fishing, and tilling the soil. A similar condition prevailed in Sweden and Norway, which were divided, like D., among a number of petty rulers. See SWEDEN, NORWAY. The women among the ancient Scandinavians were regarded as the equals of the men; and their chastity, heroic fortitude under dangers, and devotion to their families, are honourably mentioned by the oldest bards. As the power of Rome declined, that of the Northmen increased. They began to make successful inroads on England in the 8th and 9th centuries. Rollo established himself with his followers in France in 912, and his countrymen, under other leaders, gradually peopled the Faröe Isles, the Orkneys and Shetlands, Iceland, a part of Ireland, and penetrated to Spain, Italy, and Sicily. In 826, Harald Klak, king of D., returned home after a marauding expedition in Germany, accompanied by Ansgarius, the apostle of the north, by whom he was baptized. The country was now torn by civil dissensions between the adherents of the ancient and modern faith. Gorm the Old, the first authentic king of D., the bitter enemy of Christianity, died in 935, after having subjugated the several territories to his sway; and although his death gave fresh vigour to the diffusion of the new faith, paganism kept its ground for 200 years longer, and numbered among its adherents many of those half-mythical heroes whose deeds are celebrated in the Eddas and the Kæmpeviser of the middle ages. The success that attended the piratical incursions of the Northmen, drew them from their own homes; and while Gorm's descendants, Sven and Knud, were reigning in England, D. was left a prey to anarchy. On the extinction of Knud's dynasty in 1042, Sven Estridson ascended the throne. Internal dissensions and external wars weakened the country, and the introduction of a feudal system raised up a powerful nobility, and ground down the once free people to a condition of oppressed serfage. Valdemar I., by the help of his great minister Axel, subjugated the Wends in 1156; conquered Rügen and Pomerania, and compelled them to adopt Christianity; and seized upon Holstein, Lauenburg, great part of Prussia, and Esthonia. His two sons, Knud VI. and Valdemar II., extended these conquests further along the Baltic; but all these acquisitions were speedily lost through the treachery of the agnate princes and the nobles. Under Valdemar III., the last of the Estridsons, the national laws were collected into one comprehensive code. He recovered Slesvig and Scania; and on his death, in 1376, his daughter Margaret secured the triple crown of Scandinavia, in the name first of her son Olaf, and subsequently of her grandson Eric. The union of Calmar was, however, rather the idea of the individual queen than of the three kingdoms, and at her death (1412), each kingdom proceeded to choose a ruler for itself. See NORWAY, SWEDEN. Eric was compelled to flee, and Christopher of Bavaria was elected king of Denmark. At his death, in 1448, the choice of the nobles and clergy —for the people had no voice in the matter—fell on Christian I., Duke of Oldenburg, descended from Skjold's race on the mother's side. On the death of his maternal uncle, he was elected Duke of Slesvig and Holstein, but he was so fettered by the coronation-oath, which the council of state had exacted from him, that he exercised little or no power. From his grandson, Christian II. (who sided with the people against the nobles), the crowns of D. and Norway passed to Frederick I., Duke of Slesvig and Holstein (1523), while Sweden elected a king of her own. Christian III., in whose reign the reformation was established, united the duchies in perpetuity to the crown in 1533. His partition of the greater part of these provinces among his brothers became a source of much mischief to D., which did not end till 1773, when the alienated territory was recovered by the cession of Oldenburg and Delmenhorst to the Grand Duke of Russia, the representative of the Holstein-Gottorp family. Frederick II., who increased the embarrassments connected with the crown-appanages, by making additional partitions in favour of his brother (the founder of the Holstein-Sonderburg family), was succeeded by Christian IV., 1588, who was the ablest of all the Danish rulers. His liberal and wise policy was, however, cramped in every direction by the arrogant nobles, to whose treasonable supineness D. owes the reverses by which she lost all the possessions she had hitherto retained in Sweden. The national disgraces and abasement which followed, led, in 1660, to the rising of the people against the nobles, and their surrender into the hands of the king of the supreme power—an act known as the *Arve-Eenvold's-Regiering's Akt.* In 1665, the *Konge Lov*, or law of settling the succession to the united crowns of D. and Norway, was drawn up, which has continued in force to our own times. For the next hundred years, the peasantry were kept in serfage, and the middle classes depressed; while the power of the crown rested in the hands of a Germanised nobility, who despised the language and usages of their country, and exerted the most baneful influence on the true national life. Many improvements were, however, effected in the mode of administering the laws, and the Danish kings, although autocrats, exercised a mild rule. The abolition of serfage was begun by Christian VII. in 1767, but not finally completed till twenty years later; it was extended to the duchies in 1804. Struensee, the minister of Christian VII., originated many other reforms in regard to freedom of the press, the abolition of monopolies, and of numerous abuses in the machinery of the state; and although these were checked for a time on his downfall, they were ultimately established under Christian's son, Frederick VI. The miseries of this reign, due to the relations maintained by D. with Napoleon, brought the country to the verge of ruin. At war with Sweden, England, Russia, and Prussia, and with the finances in a depressed condition, the kingdom was threatened with bankruptcy; and although it had speedily rallied from the injuries and losses inflicted by the battle of Copenhagen, under Nelson, in 1801, the fresh rupture with the allies, which ended in the compulsory surrender to the English of the entire fleet, after the destructive bombardment of Copenhagen, September 1807, completely paralysed the nation. By the congress of Vienna, D. was compelled to cede Norway to Sweden, in consequence of a previously existing stipulation on the part of Russia to secure this important section of the Scandinavian territory to the Swedes, in return for the part taken by the Swedish government against Napoleon. The discontent that had long been brooding in the duchies, degenerated after the stirring year of 1830 into mutual animosity between the Danish and German population, which was not allayed by the schemes devised by the court to meet the difficulties of the case. The anticipated failure of heirs to the throne complicated the questions at issue; and the Holstein party, being encouraged by the diet at Frankfort, and perhaps still more by Prussia, came to an open rupture with D. in 1848, hastened, no doubt, by the reaction produced all over the continent by the French revolution, and thus, on the accession of the present king, Frederick VII., half his subjects were in open rebellion against him. After alternate hostilities and armistices, the Slesvig-Holstein war was virtually concluded in 1849, by the victory of the Danes over the Slesvig-Holsteiners at Idsted, followed by the conclusion of peace between D. and Prussia. The liberal constitution granted by the king has fully satisfied his subjects in D. Proper, but disaffection still smoulders in the duchies, where the question of the order of succession is the principal obstacle to an adjustment of the differences. The subject has of late years been repeatedly submitted to the consideration of foreign powers, but the result of the many negotiations to which it has given rise, is as yet (June 1861) obscure and indefinite. A further consideration of the principles which regulate the succession in the duchies, must be deferred to the articles Holstein and Slesvig.

**DE'NNEWITZ**, a small village in the province of Brandenburg, Prussia, 42 miles south-south-west of Berlin. Here was fought, on the 6th of September 1813, a battle between 70,000 French, Saxons, and Poles, commanded by Marshal Ney, and 45,000 Prussians, under General Tauentzien. The fighting was obstinate to the last degree. Both armies more than once drove each other from their positions, but the patriotic enthusiasm of the Prussians finally prevailed, and Ney gave the order to retreat. At this moment Bernadotte, crown-prince of Sweden, appeared at the head of 70 battalions of Russians and Swedes, supported by 10,000 horse, and preceded by 150 pieces of cannon. These fresh troops turned the retreat into a complete rout, until the whole of the French army presented nothing but a vast mass of fugitives. The French lost 15,000 killed, wounded, and prisoners (the Germans say 20,000), and 43 pieces of cannon. The loss of the allies was 6000 killed and wounded, of whom 5000 were Prussians. The most important feature of this victory to the Prussians was that most of their troops were *landwehr* (militia), for whom Napoleon had expressed the utmost contempt, designating them a 'rabble.'

**DENNIS**, John, the son of a London saddler, was born in London in 1657. He was put to school at Harrow; and afterwards, in 1675, he went to Caius College, Cambridge. Four years afterwards, he removed to Trinity Hall in the same university, and in 1683, took there his degree of M.A. After leaving Cambridge, he travelled on the continent, passing through France and Italy. Returning home, and in the possession of a small fortune, he joined the Whigs, and brought a sufficiently rancorous pen to the assistance of his party. He formed the acquaintance of Dryden and Wycherley, and other distinguished wits of the time, and instigated by companionship, as well as by native bent, he made various attempts as a theatrical writer. D. was expensive in his habits; and having dissipated his fortune, he had to depend for subsistence during the remainder of his life on private patronage and his pen. For several years, he enjoyed a small annuity procured for him by Lord Halifax, but that he outlived. He became blind before he died; and in his distress, some of those he had flattered, and some of those he had abused, got up a play for his benefit. He died in 1734. D. had an ungovernable temper, and made many enemies; and his name, which his own writings could not preserve, will live for ever in their contempt and hate. He is one of the best abused men in English literature. Swift lampooned him, Pope assailed him in the *Essay on Criticism*, and finally 'damned him to everlasting fame' in the *Dunciad*.

**DENON**, Dominique Vivant, Baron, was born at Châlons-sur-Saône, January 4, 1747. At an early period, he went to Paris, to study law, but quickly betook himself to the fine arts, and acquired a high reputation as an amateur and art critic. During a residence in Southern Italy, he spent much of his time in studying etching and mezzotint engraving, and along with the Abbé St Non, wrote a *Voyage Pittoresque de Naples et de Sicile* (Par. 1788). Afterwards, he lived at Venice, and other Italian cities, but returned to France during the Revolution. Having, at the house of Madame Beauharnais, formed the acquaintance of Bonaparte, he was chosen by him to accompany the expedition to Egypt in the capacity of a *savant*. He was indefatigable in drawing the relics of ancient Egyptian art. In 1802, he published his *Voyage dans la Basse et la Haute Egypte*, the engravings attached to which admirable work are very correct, and prove D. to have been a skilful artist. As a member of the Egyptian Institute, he had also the most important part in the *Description de l'Egypte* drawn up by that learned body. Bonaparte now made him Inspector-general of Museums, in which capacity he exhibited great ability. He accompanied Bonaparte in various subsequent expeditions, and suggested to him what art-treasures of the conquered cities would be most suitable for the Louvre. After 1815, he was dismissed from his office. The remaining years of his life were occupied in preparing for publication a History of Art, to be illustrated by the best artists, but he did not live to finish it, having died 27th April 1825. D.'s work was completed by Amaury Duval, and published in 1829, under the title *Monuments des Arts du Dessin chez les Peuples tant Anciens que Modernes*. D. himself executed as many as 300 etchings, chiefly imitations of the style of Rembrandt.

**DÉNOUEMENT** (Fr. from *dénouer*, to untie, which again is from *nœud*, a knot.) In Fiction, this term is generally applied to the termination or catastrophe of a play or romance; but, more strictly speaking, it designates the train of circumstances solving the plot, and hastening the catastrophe. A good dénouement in a novel or play should be natural, as a result of the preceding plot, and yet should not be so obvious as to be easily anticipated. Forced and arbitrary solutions of plot, offending against nature and common sense, are frequently perpetrated for theatrical effect (*coups de théâtre*).

**DENS**, Peter, a well-known Roman Catholic theologian, was born in 1690, at Boom, a small Belgian town, situated on the river Rupel, about 10 miles south of Antwerp. Apparently, nothing is known—at least by Protestant writers—regarding the incidents of his life, as his name appears in no encyclopædia or biographical work that we are acquainted with. The scanty information we possess is derived from the epitaph inscribed on his tomb in the chapel of the archiepiscopal college of Malines by the present (1857) rector. From this epitaph it appears that he was reader in theology at Malines (something equivalent to our professor of divinity) for twelve years, *plebanus* or parish priest of St Rumold's or Rumbold's Church in the same city, and president of the College of Malines for 40 years. He also held various honorary church offices. He was canon and penitentiary, synodical examiner and scholastic archpriest of St Rumold's—the metropolitan church of Belgium. He died 15th February 1775, in the 85th year of his age. The work which has rendered D.'s name familiar, even to the Protestant public, is his *Theologia Moralis et Dogmatica*. It is a systematic exposition and defence—in the form of a catechism—of every point of ethics and doctrine maintained by Roman Catholics, and is extensively, if not generally, adopted as the text-book of theology in their colleges. It appears to owe its popularity more to its being a handy and usable compilation than to any great talent exhibited by its author. The casuistical parts of the work have been severely criticised by Protestant moralists. The edition we have consulted is the Dublin one of 1832.

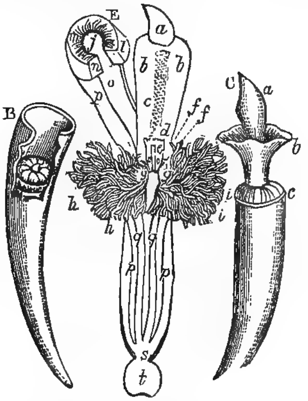
**DE'NSITY.** When of two bodies of equal bulk or volume, the one contains more matter than the other, it is said to have greater density than that other. The quantity of matter is measured by the weight, and thus density and specific gravity come to be proportional to one another. Platina, which is about 21 times the weight of water, long passed for the densest body; but Breithaup of Freiburg, in

1833, made out *iridium* to be twice as dense. Rare is opposed to dense, and the rarest body known is *hydrogen*, which is about 14½ times rarer than atmospheric air. The density of bodies is diminished by heat, and increased by cold. See Heat, Matter.

**DE'NTA**, or **GYE'NTA**, a market-town of Hungary, situated on the Berzava, about 30 miles south of Temesvar. It has several large annual fairs. Pop. 5100.

**DENTAL SYSTEM.** See Teeth.

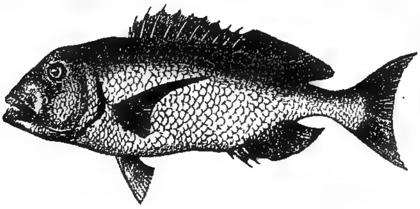
**DENTALIUM** (Lat. *dens*, a tooth), a genus of marine gasteropodous molluscs, of the order *Tubulibranchiata*, having two symmetrical *branchiæ* (gills), which are enclosed, along with all the other soft parts of the body, in an elongated shelly tube. The tube is conical, somewhat curved, and has a considerable resemblance to an elephant's tusk in miniature. Until recently, from a mistake originating in the similarity of its branchiæ to those of some of the *Annelides*, the D. was ranked in that order. Fossil species abound in the Tertiary formations.



Dentalium:

B, the shell of Dentalium Entalis, broken longitudinally, shewing the animal in a contracted state. C, the shell, shewing the animal advancing out; *a* and *b*, the foot, the lobes of which are developed in the form of a corolla; *c*, a part of the collar of the mantle. E, the animal, magnified, extricated from the shell, with the mantle slit along the dorsal and medial line, detached in part from its posterior insertion, and turned aside so as to shew the parts enclosed; *a*, the extremity of the foot, which closes the aperture *j*, of the collar *lm*, of the mantle *nop*; *bb*, lobes of the foot; *c*, the foot itself, presenting a depression or a channel, running its whole length; *d*, the head; *e*, the cerebral ganglion; *f*, *f*, the two sides of the mouth; *g*, *g*, the membranes which support the branchiæ; *hh*, *ii*, the branchiæ; *pp*, *qq*, the retractor muscles; *s*, the muscle of insertion; *t*, the expanded posterior extremity, in which is situated the vent.

**DE'NTEX**, a genus of acanthopterous fishes of the family or *Sparidæ* (Sea-breams, &c.), having a deep compressed body, and generally perch-like form; a single dorsal fin, the anterior rays of which are spinous; scaly cheeks; and many small conical teeth, among which are in each jaw at least four large canine teeth, elongated, and curved inwards. One species (*D. vulgaris*), the *Dentex* of the ancient Romans, abounds in the Mediterranean, and has occasionally been taken on the southern shores of Britain. It is sometimes called the Four-toothed Sparus. It attains a large size, sometimes three feet in length, and 20 to 30 pounds weight. It is an excessively voracious fish, as its large canine teeth might be held to indicate, devouring other fishes; but is itself in much request as an article of human food, and great numbers are taken in the mouths of rivers in Dalmatia and the Levant. It is there also a considerable article of commerce, being cut in pieces, and packed in barrels with vinegar and spices, in which state it will keep good for twelve months. It was preserved in the very same way by the ancients.



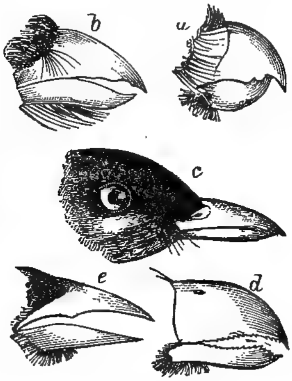
Dentex.

**DENTIFRICES** are substances, generally powders, which are employed as aids in cleaning the teeth. Charcoal and cuttle-fish bone-powder are useful as detergents; chalk, as a soft powder; and pumice, as a hard gritty substance for occasional use, when the teeth are more than ordinarily coloured. Catechu, cinchona, and rhatany are employed to give astringency to the tooth-powder; myrrh, to impart odour; and bole armeniac, to communicate a red colour. Common salt, cream of tartar, phosphate of soda, and sulphate of potash, are occasionally used; and where the breath has an unpleasant odour, the addition of 4 parts of bleaching-powder (chloride of lime) to the 100 of the tooth-powder, removes the fœtic character of the breath, and also tends to whiten the teeth.

**DE'NTILS** (Lat. *dens*, a tooth), in the Ionic, Corinthian, and Composite orders of architecture, are ornaments resembling teeth. See Entablature.

**DENTINE** is the thin layer of cement or enamel which more or less coats the teeth of the mammalia, and from the compactness of its structure and fine texture, it is generally called the ivory of the tooth. It is very hard and durable, and consists mainly of phosphate of lime accompanied by gelatine.

**DENTIRO'STRES**, a tribe or sub-order of birds, of the order *Insessores*, characterised by a bill with a marginal notch towards the extremity of the upper mandible. It is composed chiefly of insectivorous birds, although the Shrikes (*Laniadæ*), which belong



Examples of Notched Bills:

The notches or serratures are evidently adapted to the better securing of the prey; and this conformation appears not only in the *Dentirostres*, but in birds of other groups and orders. Examples may be seen in the double-toothed Falcons, as in the genus Harpagus, *a*; in the Nogons, *b*; in the subgenus Andropadus, *c*; and in the Chizærhis Variegata, *d*, where the teeth are small, sharp, regular, and of equal size. The *Lanio* of Vieillot, *e*, has a central or raptorial tooth to its bill.

to it, prey also on small birds, quadrupeds, and reptiles. Among the other families of D. are *Merulidæ* (Thrushes, &c.), *Sylviadæ* (Warblers, &c.), *Ampelidæ* (Chatterers), and *Muscicapidæ* (Fly-catchers, &c.).

**DE'NTISTRY**, the art of the dentist, or that of treating disease in the teeth (*Dental Surgery*), and of replacing these organs when lost (*Mechanical Dentistry*).

1. *Dental Surgery.*—The disorders to which the teeth are liable are those arising from defective development, such as imperfections in form or structure, irregularity of position, &c.; those, again, constituting diseases more properly so called, such as caries or dental decay, necrosis or death of a tooth, inflammation or neuralgia of the soft tissues connected with them, such as the gum, the central pulp or *nerve*, &c.; lastly, those arising from accidents of various kinds, such as blows, falls, and the like.

The treatment of all these different affections is generally of a *local* kind; or, in other words, confined to the spot in which the disease manifests itself. But dental diseases themselves are not always of a purely local nature; and it may be generally stated that wherever a tooth becomes diseased without any well marked or ostensible cause, such a tooth has been originally defective or weak. It has been, in fact, imperfectly developed, and this imperfection is due to *constitutional* causes, or such as affect the general health of the individual. In this way, a very slight cause is sufficient to excite disease in, and lead to the destruction of, such a tooth. Disease impairs what little vitality it already possesses; it becomes less and less able to resist the action even of such influences as it is naturally exposed to in the mouth—chemical decomposition is set up, and the substance of the tooth is broken down, and decays—literally, rots away.

The object of the dentist, in these circumstances, is twofold: he either attempts to arrest the decay, and repair its ravages; or he removes the diseased tooth altogether. These operations, along with supplying artificial teeth when the natural ones are lost, constitute the main offices of dentistry.

Premising that all operations in dentistry require to be modified according to different cases, we shall shortly describe the various manipulations required in their performance.

*Scaling.*—This is a little operation, by which the accumulation of a substance termed 'tartar' is removed from the teeth. Tartar is a deposit from the saliva, and lodges in greatest quantity most commonly behind the lower front-teeth. When allowed to accumulate to any extent, it causes absorption of the gums, whereby the necks of the teeth are exposed, and they become loosened, and fall out. Its removal is effected by little hoe-shaped steel instruments, bent in a manner to reach more easily those situations in which the tartar is found. Their mode of use is by inserting the point of any one of them under the free edge of the mass of tartar, at the gum, and lifting it away from the backs of the teeth to which it is adherent. The teeth are then freed from any particles still sticking about them, and their surface smoothed by being rubbed with pumice-powder or chalk.

*Regulating.*—The teeth of the second, or permanent or adult set, are very liable to be crowded and misplaced, one overlapping the other, or those of the upper-jaw falling behind those of the lower when the mouth is closed, thus producing the prominent condition of the under-jaw denominated 'under-hung.' To remedy these defects, a variety of means have been adopted by dentists; the principle upon which all of them act, however, being that of pressing the displaced tooth or teeth into the natural position. This, of course, requires that room or space should exist for them to be thus adjusted; and where this is not the case, the usual procedure is to remove one or more of the back-teeth, or those which it is less desirable to preserve. On matters being thus prepared, a plate or frame is fitted to the gums and remaining teeth, and fixed there in the same manner as an artificial set of teeth, and as shall be described in speaking of them. Two modes are then at the dentist's disposal for bringing the faulty teeth into position—viz., either that of *dragging* them into their place by means of elastic ligatures passed round them in a suitable manner, and attached to the plate as a fixed point; or, again, that of *pressing* them into position by means of small wedges of dry wood inserted between the adjacent part of the plate and the teeth to be moved; so that on the moisture of the mouth causing the wood to swell, it acts in this way with great force. Some considerable time is necessary to complete the regulation of misplaced teeth; and even after they have assumed their proper position, they require to be carefully maintained there, otherwise a tendency to resume their former irregularity soon manifests itself.

*Stopping or Filling.*—This is one of the most important and delicate operations the dentist has to perform. The first step to be taken in filling or 'stuffing' a tooth, as it is sometimes called, is to clear away all decayed and decaying substance. For this purpose, a number of slender digging and excavating steel instruments, termed 'excavators,' are required. With these, the hollow in the tooth is scooped out and thoroughly cleaned. If pain be occasioned by this process, the operation of destroying the nerve had better at once be resorted to. This is performed in several ways. Where the tooth is single-fanged, as in front-teeth, the nerve may be bored out by passing a slender broach, or square and pointed steel wire, up into the central cavity of the tooth, with a slight rotatory motion. Where this cannot be done, however, the best plan is to destroy the nerve by some caustic application, such as chloride of zinc. The method of doing this is to clean the tooth thoroughly out, and then to apply a little bit of the caustic—about the size of a barley-pickle or a grain of rice—pressing it well into the decayed hollow, and then filling it over with soft bees-wax. This should be allowed to remain there for six, eight, or twelve hours; it may at the end of that time be taken out, and the stopping proceeded with.

The cavity being cleaned out until its walls are of sound and hard tooth-bone, it is to be well dried, and the plug of stopping-material inserted. Various substances are employed for this purpose, and the mode of using each is somewhat different. For temporary stoppings, pure gutta-percha is a serviceable material. A quantity sufficient to fill the cavity, and somewhat more, is to be gently warmed over a spirit-lamp—not in hot water—and when quite plastic, is to be firmly pressed with a blunt-pointed stopping-instrument or 'plugger,' into all the interstices of the hollow in the tooth—more and more being pressed in, until the surface of the plug so formed is on a level with the surface of the tooth, when all the superfluous portion should be removed, and the solid plug smoothly finished.

Another variety of stopping-material consists of amalgams of different kinds. Many absurd statements have been made regarding the evil effects of amalgam stoppings, but the only real disadvantage attending their use is, that many of them get black in the mouth, and discolour the tooth, while those that do not get black are friable, and crumble away in a short space of time. They are to be readily obtained, made up, and under various names. None of them seem very much superior to the common one of silver, tin, and mercury. The amalgam, then, whatever one it may be, is to be reduced to a firm, plastic consistence, and carefully introduced into the dried cavity in the same way as described regarding the gutta-percha, and is to be finished off in precisely a similar manner.

Gold-stopping is an operation of a much more complicated and difficult description. The materials used here are either gold-foil—that is, thick gold-leaf—or the peculiar substance, or rather the peculiar form in which gold exists, known as sponge-gold. In stopping a tooth with gold, even more care is necessary in preparing the cavity than what has been already inculcated. Its *shape* must now also be taken into account, and the nearer it approaches to a cylindrical form the better. The gold-foil, when it is employed, should be cut into strips, their breadth varying according to circumstances. Various modes of packing the gold are adopted, the chief object being that the foil shall lie in the cavity in such a way that its edges, and not its flat surfaces, shall be presented at the surface of the plug; otherwise the plug will be liable to injury by layers of it peeling off. In stopping with sponge-gold, the preparatory steps are the same as for foil-stopping; it is, however, necessary to be more careful that no moisture be allowed to interfere with the operations.

The surface of a gold plug, formed in either of these ways, should be well consolidated by hard pressure with a blunt plugger, and the superfluous portion being removed, it ought to be burnished until it assumes a brilliant metallic lustre.

*Extraction.*—This is the principal surgical operation falling to the dentist. It is most commonly demanded in consequence of what is termed toothache—a disorder which, however, is not always one and the same in its nature. This want of uniformity in the nature of those diseased states to which teeth are subject, and which are comprehensively denominated toothache, leads to the conflicting results obtained from those applications recommended for its cure. These remedies are numerous, and of various characters. To explain their mode of action, and the particular symptoms indicating the selection of each one in preference to another, would here be out of place. Their intention, in general, is either to destroy the nervous fibres existing in a tooth, or to narcotise and render them insensible. Among those acting in the former manner, are such as creasote, chloride of zinc, nitrate of silver, alum, tannin, &c.; among those acting in the latter mode are chloroform, laudanum, ether, spirit of camphor, &c. Perhaps, as a general rule, it may be stated, that before proceeding to extraction of a tooth on account of pain, some of these milder measures should be tried, in order, if possible, to avert the necessity for such an operation. There is no necessity for describing the method of their application, further than to remark, that in all cases the decayed cavity should previously be well cleaned out, otherwise the remedy employed may be altogether prevented from reaching the spot where it is intended to act.

Where extraction comes to be demanded, it is performed by means of instruments adapted to the special peculiarities of the tooth requiring removal, or to the circumstances in which it exists. Thus the instruments employed in ordinary cases are termed forceps, and these are adapted in their construction to that particular tooth for which each instrument is intended, different teeth requiring different patterns; again, those instruments used for the same purpose, and termed tooth-keys, likewise require adaptation to individual cases; lastly, those instruments employed for digging out the fangs remaining after total decay of the crown, and termed elevators or punches, are made of such forms as may suit various conditions in which these roots or fangs are found.

The great matter is, that each tooth should be extracted in accordance with its anatomical configuration; and to accomplish this, of course, requires an intimate knowledge of the natural form proper to each of these organs individually; without this, it is impossible to extract any tooth upon a correct principle. The tooth is grasped, as far as the instrument can be made to do so, by that portion of the root or fang which just emerges from, or perhaps which is just within, the socket; it is then loosened, not exactly by pulling, but rather by moving it in a lateral or in a rotatory manner, in strict accordance with the respective character of fang possessed; and finally, on its being thus detached from its connection with the jaw, it is, with very little force, easily lifted from its socket.

Anæsthetics are employed in the extraction of teeth in the same manner as for other surgical operations, where it is desirable to abolish pain. Ether and chloroform are the only agents of this nature which have as yet been found generally fit for practical application in cases of the kind. Other modes of inducing insensibility, local or general, have been proposed from time to time, but one after another has been abandoned as unserviceable. All over the world quack nostrums are found for rendering this operation painless; these, however, do not demand consideration here, as had any one of them afforded the least chance of success, it would long ago have been gladly welcomed and generally adopted by dentists.

2. *Mechanical Dentistry.*—The manufacture of artificial teeth, and other matters comprehended in mechanical dentistry, involve many subjects of which no adequate or satisfactory idea can be conveyed by mere description. Nothing beyond a mere outline of the materials employed, and the leading processes involved in this branch of art, can be given without practical illustration. The various conditions of the mouth requiring the adaptation of artificial teeth, range from cases where only one tooth may be wanting, to those where not a single tooth remains in the jaw, above or below. Accordingly, artificial teeth are spoken of as partial or complete sets—a partial set being one for either upper or lower jaw, where some of the natural teeth still remain; a complete set being one for either jaw, where none are left, or for both jaws, when both are in such circumstances.

The simplest form of partial sets is what is termed a pivoted tooth. This is an artificial tooth fixed in the mouth upon the fang or root of one whose crown has been lost by decay or otherwise. The mode of procedure is as follows: An artificial tooth, as near as possible to the colour and form of that to be replaced, is selected. This artificial tooth may be either the crown of a natural human tooth corresponding to that lost, or one made in imitation of this, in a species of pottery-ware, and by a process much too long for detail in this place. Such *mineral teeth*, as these last are termed, are manufactured on an extensive scale, and sold ready for use to dentists. A tooth of either kind then being selected, is accurately fitted to the root remaining in the mouth, and, by means of a gold pin, adjusted to, and inserted into the open central canal existing in the root—the other extremity of this gold pin being attached to the substitute tooth—the whole is fixed in its natural position, in a manner that renders detection almost impossible.

Where more than one tooth is required, and occasionally even where only one is necessary, a somewhat different contrivance is had recourse to. What is called a 'plate' requires to be fitted to the gum and remaining teeth in so precise and perfect a manner as to lie quite firmly and steadily in its place, and to which the artificial teeth required are subsequently fixed.

This 'plate' is frequently made of gold, silver, or platinum plate, of the thickness of card-board, in which case, the name of 'plate' is used in its literal signification. But such plates may be made of other substances besides those of gold, silver, &c., such as the ivory of the walrus, or the hippopotamus's tusk, or what is more common now, of vulcanised Caoutchouc (q. v.) or Vulcanite. The first step in any of these processes is to obtain an exact model of the gum and other parts upon which the plate is to rest. This is obtained by introducing bees-wax, or gutta-percha, softened by previous heating, into the patient's mouth, and pressing it forcibly upon those parts of which an impression is desired. On removing the wax or other substance from the mouth, Paris plaster is poured into the mould thus procured, and on its hardening, or 'setting,' this plaster-cast presents an exact counterpart of the gum. It is upon this plaster-model that all the subsequent operations are performed in fitting the artificial set. The following is a very brief sketch of the principal steps in working each of the three classes of material alluded to as being used for these purposes.

*Walrus or Hippopotamus Tusk Sets.*—In commencing a set of this kind, and, indeed, of any kind, the surface of the plaster-model requires to be hardened, in order to render it less friable and subject to abrasion during its use. This is generally done either by varnishing it, or boiling it in linseed oil, melted wax, stearine, or the like. This being done, a block of suitable size is cut from the tusk to be employed, and by means of different-shaped cutting tools termed scalpers, it is carved until it fits the model accurately. The way in which its fitting is secured consists in painting the model on that part representing the gum, &c., with any common dark colour which will remain wet; the block is then applied to the painted surface, and wherever a mark is left by the colour, it is cut away by a scalper, and the same process repeated, until, by constantly doing so, the concavity thus produced in the block corresponds exactly to the convexity of the model representing the patient's gum. The block is then trimmed and adjusted, according to taste and circumstances; and is finished either by carving upon its substance the appearance of the teeth required, or by fitting and fixing into it mineral teeth of the kind already described.

*Metallic-plate Sets.*—Where the framework lying upon the gum is to be of gold or silver plate, or the like, it is necessary to procure, besides the plaster-model, a metal one. This metal-model is generally cast in zinc, gun-metal, or some such material; and a counter-model of a softer metal, generally lead, is taken from this again, so that a complete pair of dies is in this way procured. The gold or other plate, cut of a convenient size, is then stamped between the two metallic dies, and so made to assume the precise form desired. It is then trimmed, and any more delicate adjustments made upon it, such as soldering clasps round those parts where it is to embrace any teeth remaining in the mouth, and finally completed by having the individual artificial teeth added to it, and adapted to the comfort and convenience of the wearer. The mode of fastening the teeth to the plate is in one of two ways. One kind of teeth have a tube extending along their whole length, and these are fastened by means of a pin fixed to the plate, upon which the tooth is secured by this pin passing up the tube alluded to. The other kind are provided with short platinum pins, fixed in the material of the tooth during its manufacture, to which pins a piece of gold or other plate is soldered, and this, again, to the framework of the set itself, wherever they are required.

*Vulcanite Sets.*—The first step in the manufacture of a vulcanite set of teeth is to make a pattern set in wax, with the mineral teeth constructed for the purpose, and which are to be used in the piece when it is finished, fixed in the wax; the whole constituting, in short, an exact fac-simile of what the completed set is intended to be. This pattern set is, of course, made upon and fitted to the plaster-model as usual, and is adjusted to the wearer's mouth precisely as if it were the set to be worn there. When everything is thus prepared, a duplicate of the wax-set is made in vulcanite—the vulcanite replacing the wax, and the mineral teeth being retained as they were. The process by which the vulcanite is made to take the place of the wax, is too complex for description here.

The foregoing description comprehends most of the operations connected with surgical and mechanical dentistry. For a more detailed account of them, as well as the discussion of many minor points connected with the subject, we must refer to the numerous and beautifully illustrated works specially devoted to such matters, lately published both in this country and America; of these, Tomes' *Dental Surgery*, published by Churchill, London, Taft's *Operative Dentistry*, and Richardson's *Mechanical Dentistry*, both published in America, deserve to be specially mentioned as among the latest and best works on the subject.

**DENTITION**, PERIOD OF (Lat. *dentitio*, the process of teething, from *dens*, a tooth). In man and most mammals, there are two distinct sets of teeth: one set which appears shortly after birth, and which are termed the *milk* or *deciduous* teeth; and a second set, which, after a few years, replaces these, and which are termed *permanent* teeth.

In the human subject, the milk-teeth are twenty in number, each jaw containing (from before backwards) four incisors, two canines, and four molars; while the permanent teeth are thirty-two in number, each jaw containing four incisors, two canines, four premolars or bicuspids, and six molars. Anatomists are in the habit of briefly expressing the number of the different kinds of teeth in any mammal by what they term a *dental formula*. The permanent teeth in man are represented by the formula, $i\,\frac{2-2}{2-2}$, $c\,\frac{1-1}{1-1}$, $p\,\frac{2-2}{2-2}$, $m\,\frac{3-3}{3-3} = 32$, where the letters $i$, $c$, $p$, $m$, stand for incisors, canines, premolars, and molars, and where the two terms in each numerator and in each denominator represent the number of each particular kind of tooth in each half of the upper and lower jaw respectively. As these formulæ are of common use in most works on zoology and comparative anatomy, we add another example—that of the permanent teeth of the hog, whose formula is, $i\,\frac{3-3}{3-3}$, $c\,\frac{1-1}{1-1}$, $p\,\frac{4-4}{4-4}$, $m\,\frac{3-3}{3-3} = 44$; which signifies that there are on each side of both upper and lower jaws three incisors, one canine, four premolars, and three molars, making in all 44 teeth.

For a general description of the form and uses of these different kinds of teeth, we refer the reader to the article DIGESTION, ORGANS AND PROCESS OF, where their special uses are noticed in reference to the digestive function; while the history of their structure, &c., is given in the article TEETH.

The following is the usual order and period of appearance of the milk-teeth: The four central incisors usually appear through the gums about the 7th month after birth, those of the lower jaw shewing themselves first. The lateral incisors next appear between the 7th and 10th months; the anterior molars shew themselves about the 13th month, and are soon followed by the canines, which usually appear between the 14th and 21st months. The posterior molars are the last and most uncertain in their time of protrusion, which may range from the 18th month to the end of the 3d year. Except in the case of the incisors, there is no definite law as to whether the upper or lower teeth first appear.

About the middle or end of the 7th year, the jaw-bones have become sufficiently elongated to permit the appearance of the first true molar; and about the same time, the central incisors are replaced by the corresponding permanent teeth. The advance of the permanent teeth towards the surface of the gum causes the absorption of the roots of the temporary teeth, and thus facilitates their shedding; the crown falling off, and leaving room for the permanent tooth behind it to come forward and supply its place.

In the replacement of the first by the second set of teeth, the following order is observed: The middle incisors are first shed and renewed (usually when the child is about eight years of age), and then the lateral incisors (perhaps a year later). The anterior molars of the first set are then replaced by the anterior premolars (this usually happens about the 11th year); and about a year afterwards the posterior deciduous molars are replaced by the second premolars. The persistent canines take the place of the deciduous ones in the 12th year; these being the last of the milk-teeth to be exchanged. The second molars appear between the ages of twelve and a half and fourteen years; and the third molars, or *dentes sapientiæ* (wisdom teeth), seldom appear till three or four years subsequently, and often much later.

The factory laws in England render it very important that we should be able to determine the ages of *nine* and *thirteen* in children, because before a child is nine years old, it is illegal to employ it in factory-work; and until it is thirteen, it may only be employed during nine hours a day. Mr Saunders, a well-known dentist, has shewn in his pamphlet, *The Teeth a Test of Age, considered with Reference to Factory Children*, that the teeth afford a far better test of age at this period of life, than the standard of height which has been adopted by the legislature for this purpose.

*Dangers attending Teething.*—The teeth are formed in closed sacs, and in rising to the surface in the progress of their growth they slowly penetrate the gum from below; a process familiarly called 'cutting the teeth.' The minuter physiology of this process will be described in a separate article (see TEETH); in the present, it will be sufficient to indicate shortly the dangers to which children are exposed, particularly during the period of the first dentition, or from five months old to two years or more. Infants are occasionally said to die of 'teething;' but this, like many other vague terms, may be said to be only a cloak for ignorance; for the mere cutting of the teeth is never, by itself, mortal, or even a serious source of suffering. It only becomes a cause of disease by its reflected influence on the delicate nervous system of the child. The period of dentition, in fact, is one during which the whole organisation of the infant is undergoing a revolution; in passing from an exclusively milk-diet to one of a more complex character, the entire digestive system undergoes a corresponding development. The diseases of this period of life correspond in importance with the great physiological changes taking place in it, and with the dangers of derangement in the just order or symmetry of their development. If these diseases often appear to be due directly to the cutting of a tooth, it is because complex causes of disorder have prepared the way for a morbid change, which is ready to be developed into activity by a comparatively slight irritation. The principal diseases of dentition are Diarrhœa (q. v.), Convulsions (q. v.), vomiting, and hydrocephalus, or tubercular inflammation of the membranes of the brain, which are all apt to originate at this period of infantile life, and to coincide more or less closely with the development of the first set of teeth. It is very doubtful how far the operation of cutting the gum with a lancet, so commonly supposed a specific for the diseases of dentition, ought to be encouraged. Sometimes there is evident irritation, or even inflammation of the gum, and then the operation will probably at least do no harm; but the indiscriminating use of the gum-lancet, at the request of anxious but foolish mothers and nurses, is characteristic of a weak and erroneous routine practice, and must be denounced as an unwarrantable interference with the truly beautiful process by which the tooth is gradually evolved from its socket, in most cases, without any suffering. The special treatment of the diseases of dentition is discussed under the separate articles devoted to some of these diseases.

**D'ENTRECASTEAUX**, a term of various application in Australasia, affords one of the few traces of French discovery in that part of the world. It indicates an archipelago, a cape, and a channel.—1. The archipelago lies between New Guinea and New Ireland, about lat. 10° S., and long. 151° E.—2. The cape, a headland in Swan River Colony, forms nearly the south-west point of Australia, being in lat. 34° 52′ S., and long. 116° E. 3. The channel, an arm of the Pacific, separates Bruné Island from the south-east coast of Tasmania or Van Diemen's Land. It is about lat. 43° 25′ S., and long. 147° 15′ E., is 35 miles long, and varies in width from 3 to 9 miles. On the side of the mainland, it is connected with the interior by means of the Derwent and the Huon, communicating through the former with Hobart-Town, the capital.

**DENUDA'TION** is the removal of solid matter by water in motion, whether of rivers or of the waves and currents of the sea, and the consequent laying bare of some inferior rock. The rate of abrasion depends upon the velocity of the current, and the nature of the solid materials through which it flows; these two causes equally affect the deposition of the abraded matter, for the carrying power of the water varies with its velocity and with the weight of the particles. The heavier dêbris—large stones and gravel—are carried short distances, and deposited generally in masses; the finer particles are conveyed even by a slow current to great distances, and scattered in thin layers over extensive districts. All deposition, except in the case of showers of volcanic ashes, is the sign of a superficial waste going on contemporaneously, and to an equal extent, elsewhere, the gain at one point being equal to the loss at another. No new material has been used in the formation of the sedimentary rocks. The degradation and abrasion of igneous rocks provided the materials of the earliest strata; these in their turn were frequently abraded and re-deposited, under new conditions, and with the remains of a newer fauna and flora. Thus the crust of the globe has not actually increased in thickness, for whenever it acquires density in one place, it becomes thinner in another. The changes that have been effected by denudation, and the amount of matter thus transported, are difficult to imagine. In districts where faults occur, the surface has been smoothed, and the uptilted ends have been washed away. These faults sometimes extend over several hundred square miles, and the dislocations, had they remained unaltered, would have produced mountains with precipitous escarpments of different heights, reaching occasionally to a thousand feet. But denudation not only levelled the surface of the earth; in regions with horizontal stratification it has produced inequalities, hollowing out valleys of denudation, and often carrying away the whole of the superficial strata, leaving mountains here and there which shew, by the direction and succession of their beds, that the strata of which they are composed were at one time continuous.

**DEO'BSTRUENTS** (Lat. *de*, from, and *obstruo*, I obstruct), medicines which have the property of removing obstructions, especially in the Lymphatic System (q. v.). The glands of the thorax and abdomen (e. g., the liver, spleen, kidney, &c.), as well as the lymphatic and lacteal glands, are subject to enlargements, which were formerly, under a mechanical theory of disease, universally ascribed to obstructions of their outlets, or of the vessels in connection with them; against all of these states, deobstruents were employed with varying success. The favourite deobstruent remedies are mercury, iodine, and bromine; blisters and friction, with stimulating liniments, may be said also to have a like action in some cases.

**DE'ODAND.** A personal chattel which was the immediate and accidental occasion of the death of a reasonable creature, was, by the law of England, forfeited to the crown, in order that it might be applied to pious uses, or given to God, as the term implies. The rule did not apply where the instrument had been intentionally used for the purpose of causing death, as in cases of murder and homicide. Blackstone traces the origin of the custom to the popish prayers for the souls of the dead, and asserts that deodands were 'designed in the blind days of popery, as an expiation for the souls of such as were snatched away by sudden death; in the same manner as the apparel of a stranger, who was found dead, was applied to purchase masses for the good of his soul.' The more probable view is, that it originated in the natural horror which is felt for whatever has been the instrument of so dreadful an occurrence; just like the Jewish law, that if 'an ox gore a man that he die, the ox shall be stoned, and his flesh shall not be eaten;' or the old English law, that a well in which a person was drowned should be filled up under the inspection of the coroner. Similar regulations are to be found in the legal systems of most nations. The law of deodand was abolished by 9 and 10 Vict. c. 62.

**DEODA'R.** See CEDAR.

**DEODAR**, remarkable as being one of the pettiest states in the world, is a district in the north-west of Guzerat, which is itself within the limits of the presidency of Bombay. Containing only 80 square miles, and 2000 inhabitants, it is yet subdivided into as many independent communities as there are villages—the whole being, for external purposes, under the gratuitous protection of the British government. The principal village, bearing the name of Deodar, is in lat. 24° 9′ N., and long. 71° 49′ E. The district was forced on the East India Company in 1819, as having become a refuge of marauders.

**DEO'DORISERS** are chemical substances employed for the purpose of absorbing or destroying the odoriferous principles evolved especially from decomposing animal and vegetable matter. They strictly belong to the classes of substances known as ANTISEPTICS (q. v.) and DISINFECTANTS (q. v.).

**DEORI'**, sometimes distinguished as BURA DEORI or GREAT DEORI, a town of Hindustan, stands in lat. 23° 22′ N., and long. 79° 4′ E., and is 1705 feet above the level of the sea. Though it has been but little noticed by travellers or writers, yet it appears to be not unworthy of its second name, as mentioned above, for, on its being burned down, some years ago, by a freebooter, 30,000 people are said to have perished in the flames. It is situated in the south-west part of the sub-presidency of the North-west Provinces, on the table-land, whence flow the Sone to the Ganges, and the Nerbudda to the Arabian Sea; so that the territory of Saugor and Nerbudda, within which it is contained, is common to the two principal basins of Northern India. The place is about half-way between the better-known cities of Saugor and Gurrah, being 44 miles to the south-east of the former, and 41 to the north-west of the latter.

**DEOXIDA'TION** is the term applied to the process of withdrawing the oxygen from a compound, as in the reduction of the native peroxide of iron in the smelting furnaces to the condition of metallic iron. On the small scale, in experimental inquiries, the process of deoxidation may be carried on before the BLOW-PIPE (q. v.), where the inner or reducing flame is essentially a deoxidising one.

**DEPA'RTMENT** (Fr. *Departement*), a term used to denote a territorial division in France. Previous to the Revolution, France was divided into provinces; but in 1790 Mirabeau rose in the Constituent Assembly, and declared that, after having abolished aristocracy, it was neither convenient nor safe to preserve these provincial divisions. He alleged that they were too large, that they tended to concentrate the administrative power in the hands of a few, and that such power soon becomes aristocratic of necessity. He suggested, therefore, a minuter territorial division, as a carrying out of the principles of the Revolution. This expression of opinion was followed by a decree of the Assembly, dated February 16, 1790, ordering the abolition of the old provincial divisions (34 in number), and the redistribution of the land into 83 Departments. During the year 8 of the Revolution, these were increased to 98; in 1808, the Empire consisted of 127; at the fall of Napoleon, of 130; and at present it consists of 89, including the three new Departments formed by the annexation of Savoy and Nice. Originally, it was intended that the Departments should be governed by persons elected by the citizens; but this plan did not suit the views of the First Consul, who placed over each Department a prefect, and a *conseil de préfecture*. The Departments were again subdivided into arrondissements, over each of which was placed a sub-prefect (*sous-préfet*). The right of naming these functionaries was reserved to the chief of the state. This system of departmental administration is still in force in France.

**DEPA'RTURE**, a term in Navigation, explained under SAILINGS. See also DEAD RECKONING.

**DEPE'NDING ACTION.** An action is said, in Scotland, to be in dependence, from the moment of citation, until it be finally decided by the House of Lords, should it be appealed to that ultimate tribunal. As a security for the implement of the decree by the defender, in the event of his being found liable, the pursuer is entitled to use either Inhibition (q. v.) or Arrestment (q. v.) on the dependence, or depending issue.

**DEPHAL** (*Artocarpus Lakoocha*), a tree of the same genus with the Bread-fruit (q. v.) and Jack (q. v.), a native of the south of India, and frequently cultivated in the northern parts of that country. The fruit is eaten, but is inferior to the Jack. The juice, like that of the Bread-fruit, is tenacious, and is used for bird-lime. The root is used for dyeing yellow. The D. is a large tree, and its timber is valued for a variety of purposes.

**DEPHLOGI'STICATED AIR.** See PHLOGISTON.

**DEPI'LATORIES, or EPI'LATORIES** (Lat. *depilo*, to pull out the hair), are chemical agents employed for removing superfluous hair from the skin. They were extensively used by the ancients, but are now restricted in their employment to the face, and to the removal of the hair from the scalp in the treatment of certain diseases. The caustic alkalies and alkaline earths are generally used, and a good recipe is to mix five parts of caustic or slaked lime, ten parts of carbonate of soda, and forty parts of lard. The tersulphuret of arsenic (commonly known as orpiment) is occasionally used, but its employment is dangerous, as any abrasion of the skin will enable the arsenical compound to begin to act. A mixture of caustic lime and orpiment constitutes some of the depilatories to be purchased; and it is believed that the Turkish *Rusma* is composed of these ingredients. A very active and comparatively safe compound is a strong solution of sulphuret of barium made into a paste with starch, which is immediately applied to the part from which the hair is to be removed, and is allowed to remain for five or ten minutes.

**DEPLOY'**, as a military movement, is a spreading-out of a body of troops in such way that it shall display a wider front and a smaller depth than it did before the deploying.

**DEPO'NENT**, a term in Latin Grammar applied to verbs having a passive form but an active signification. They are so called because they, as it were, lay down (Lat. *depono*) or dispense with the signification proper to their form. Such verbs had all originally a reflexive meaning, like the middle voice in Greek verbs; thus, *aversor*, 'I detest,' means radically, 'I turn myself away from.'

**DEPO'SIT** was a real contract of the civil or Roman law. It was the simplest of all contracts, and consisted merely in the delivery of an article by one person to another, to be kept without remuneration, and to be restored *in specie* as soon as the depositor should require.—*Inst.* iii. 15, s. 3. Return when required was the sole condition of the contract; and no obligation was incurred by the depositary but to exercise ordinary care in preservation of the article. The civil law recognised a distinction, as to the value which might be recovered by the depositor in case of loss, between the case of articles voluntarily deposited, and those which came into the hands of the depositary by the misfortune of the owner, as by fire or shipwreck. In the latter case, double the value of the article might be recovered. There was also a special provision by the edict *Nautæ, caupones, stabularii*, whereby shipmasters, innkeepers, and stablemen were compelled to exercise more than ordinary vigilance over the goods of their customers and passengers.

The principles of the civil law as to deposit have been universally adopted by modern nations. In Scotland, the name of the contract is preserved. Lord Stair, i. 13, 2, lays down that the depositary is 'not liable for light faults, or for the perishing or deterioration of the thing deposited by casualty or accident.' The article must be restored when demanded, and failure to do this will involve the depositary in liability for the consequences. See also Erskine, iii. 1, 26.

Deposit, in English Law, is a branch of bailments, which includes also loans, pledges, and letting and hiring. From each of these, deposit is distinct. It is defined by Judge Story to be 'a bailment of goods, to be kept by the bailee without reward, and delivered according to the object and purpose of the trust.'—Story on Bailments, c. ii.

The chief questions which have arisen in modern times relate to the amount of care which the depositary is bound to exercise. Judge Story lays down the principle to be, not the care which a man takes of his own affairs, but that which a reasonable being would use, and cites in support of his view the case Doorman *v.* Jenkins, ii. Ad., and Ellis 256, where a person intrusted with money placed it in his own cash-box, and the box having been stolen, the depositary was yet held liable for negligence. So also with jewels or other valuables—the nature of the article implies extra care. Where, however, a sealed packet or locked box is deposited, the question arises as to the liability of the depositary. Erskine lays it down broadly, that where such a deposit is made without shewing the contents, the depositary incurs no extra liability. But Story takes a distinction, and states that if the depositary had reasonable ground to believe the contents were valuable, he incurs liability accordingly. The immense value of the timber-trade of America raises in that country questions as to the liability of a landowner for timber left by the river on his ground. On this point, Story indicates that the smallest amount of liability is incurred. Whether or not the depositary may make use of goods left in his charge, is said by the same author to depend on the particular circumstances. If the article would benefit by use, then such use is allowable; but if injury were likely to accrue, it is not. If use is a matter indifferent, then the depositary is not entitled to the use. The admirable work of Story on Bailments is the best authority on this subject.

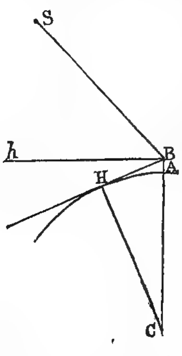
**DEPOSIT**, a term much used in Geology, to characterise those rocks which have been formed from matter that has settled from suspension in water. The materials constituting such rocks have been obtained by denudation, and their extent in one place equals the denudation in some other. Deposits are characterised according to the conditions under which they were formed, as marine, lacustrine, fluviatile, and so forth.

**DEPOSI'TION**, the testimony of a witness set down in writing. Depositions are taken either by a judge or by a commissioner specially appointed by him for that purpose. The questions to which the depositions are answers are usually put by the legal representatives of the parties to the suit, under the control of the court or commissioner, and the answers are taken down by the clerk of court, or by a clerk specially appointed for the purpose. If the competency of the questions or the admissibility of the witnesses be objected to, the objection must be stated to the court or commissioner. The latter may either dispose of the objection at the time, or reserve it for the opinion of the court by which he was appointed. It is a rule in the laws of evidence of all conutries that the deposition cannot be read where the witness might be himself produced, because his oral testimony is the best evidence, and secondary evidence is never admissible. Where he is dead, however, or insane, or beyond the jurisdiction of the court, his deposition then becomes the best evidence, and may be read in court.

**DEPOSITION OF A CLERGYMAN.** In Scotland, the minister of a parish who has been guilty either of immoral and scandalous conduct, or of preaching or otherwise publishing doctrines contrary to the standards of the church to which he has declared his adherence, or of contumaciously setting aside the authority of the Presbyterian church-courts, may be deposed from his holy office by the church-courts. By this means he is deprived not only of his ecclesiastical dignity, but of the temporalities of his benefice (stat. 1592, c. 115), and the benefice becomes vacant, just as if he were dead. He may, however, be restored to the exercise of the ministry, and to his position as a minister of the church by the General Assembly, but he cannot, of course, be restored to his benefice; and it is considered irregular that he should be so even by a new presentation by the patron, because the stigma attached to his character by his deposition is likely to affect his usefulness. Where sentence of deposition is pronounced by an inferior church-court, the judgment of which is reversed on appeal to the General Assembly, it is held that it had never been pronounced; but if the sentence be affirmed, it takes effect from the date when it was pronounced by the inferior court, and from that date the minister's right to the profits of his benefice ceases. Sentence of deposition cannot be pronounced by a presbytery in the absence of the minister, except by the authority of the General Assembly. See DEPRIVATION.

**DÉPÔT,** in Military matters, is a name sometimes given to a place where army-stores are deposited during war. In reference to the regimental system, however, a dépôt is the head-quarters of the regiment, the town or barrack where certain stores belonging to the regiment are kept, as well as the regimental-books and some of the men, when the regiment is ordered on foreign service. It is rarely that the whole strength of a regiment is engaged in active service at one time; reserve companies are kept at home, under the command of one of the officers. Either one or two companies are generally thus reserved, under the name of *dépôt companies.* They form a nucleus where recruits are received and drilled, and where the corporate existence of the regiment may be kept up. The system has existed in the British army since about the year 1825. There is an acting staff at each dépôt, of which the officers receive an allowance over and above their ordinary daily pay. There are not as many dépôts as regiments, seeing that a small body of officers can command the reserve skeletons of many regiments.

**DEPRE'SSION or DIP OF THE HORIZON** is the angle through which the sea-horizon appears depressed in consequence of the elevation of the spectator.



Let A be a point on the surface of the earth, B a point situated in a vertical line from A. Let BH be a tangent to the earth's surface drawn from B, B$h$ a line in the same vertical plane perpendicular to AB. The angle $h$BH is the *true* dip of the horizon to a spectator at B.

The true dip measured in minutes is equal to the distance in nautical miles of the visible horizon. Let C be the centre of curvature of the surface; then, since CHB is a right angle, the angle $h$BH = HCA; and the minutes in this angle are the nautical miles in the arc AH. To find this angle in minutes or nautical miles, the rule is: Multiply the square root of the height in feet by 1·063.

The true dip of the horizon, however, is not exactly the same as its apparent depression. The apparent sea-horizon is raised above its true place by *refraction* through an angle, which varies according to the state of the atmosphere and the relative temperatures of the air and water, the variation ranging from one-third to one-twenty-third of the amount of the true dip. The rule commonly employed is to diminish the true dip by about one-fourteenth of its amount, to find the apparent dip.

If S be a star or the sun in the same vertical plane with ABH, and an observation of the altitude above the sea-horizon be made by means of a sextant from the point B (as from the deck of a vessel), the apparent dip of the horizon must be subtracted from the observed angle, in order to find the altitude of the sun. Owing to the uncertainty of the amount of refraction, the nearest minute to the dip given in the tables is usually taken. The following table gives a sample of the amount of the apparent dip under ordinary state of the atmosphere and equal temperature of air and water. See Raper's *Practice of Navigation.*

| Height.<br>Feet. | Dip.<br>m. s. | Height.<br>Feet. | Dip.<br>m. s. |
|---|---|---|---|
| 0 | 0 0 | 8 | 2 50 |
| 1 | 1 0 | 9 | 3 0 |
| 2 | 1 20 | 10 | 3 10 |
| 3 | 1 40 | 20 | 4 20 |
| 4 | 2 0 | 30 | 5 20 |
| 5 | 2 10 | 40 | 6 10 |
| 6 | 2 20 | 50 | 7 0 |
| 7 | 2 40 | 100 | 9 50 |

**DEPRIVA'TION OF A CLE'RGYMAN.** In England, this may be either (1.) by a sentence declaratory in the proper court, on the ground of attainder or conviction of treason, felony, or any other infamous crime, or of conviction for heresy, infidelity, or gross immorality, or for farming or trading contrary to law, 1 and 2 Vict. c. 106, s. 31; or (2.) in pursuance of divers penal statutes, which declare the benefice void for some nonfeasance or neglect, or else some malfeasance or crime, as simony; for maintaining any doctrine in derogation of the king's supremacy, or of the Thirty-nine Articles, or the Book of Common Prayer; for neglecting to read the liturgy and articles in the church, and to declare assent to the same, within two months after induction; for using any other form of prayer than the liturgy of the Church of England; for continued neglect, after order from the bishop, followed by sequestration, to reside on the benefice. In these latter cases, the benefice is void, without any formal sentence of deprivation (Stephen's *Com.* iii. 37). A bishop may be deprived of his bishopric, but cannot be deposed, as may be done in the case of a Presbyterian clergyman, the character of a bishop, like that of a priest, being indelible. The tribunal by which the Bishop of Clogher was deprived in 1822 consisted of the archbishop and the other bishops of the province; and this precedent having been established, would probably be adhered to on any future occasion, notwithstanding that the archbishop alone might have full authority to deprive. —*Cripps's Laws of the Church,* p. 100.

**DE PROFU'NDIS** ('Out of the depths'), the first words of the 130th psalm, which forms a portion of the liturgy of the Roman Catholic Church, and is sung when the bodies of the dead are committed to the grave. A tender melancholy pervades the psalm, which, however, brightens up at the close under the conviction that with God there is 'plenteous redemption.'

**DE'PTFORD**, a town on the south bank of the Thames, about 4 miles below London Bridge, divided from Greenwich by the river Ravensbourne, a creek of deep water (*depe ford*), formerly fordable at the spot where D. Bridge now stands. It contains two parishes, St Nicholas' and St Paul's, the latter formed by act of parliament in 1727. St Nicholas' Deptford lies wholly in Kent, but St Paul's extends into Surrey—the Surrey portion being known as the Manor of Hatcham. Pop. in 1861, 45,714, chiefly engaged in the Royal Deptford Dock and Victualling Yards, and in extensive private ship-building and engineering establishments. The market-gardens of Deptford are famous. The upper portion of the town is well built, and is a favourite place of residence for persons engaged in business in London. D. forms, with Greenwich, Woolwich, Charlton, and a portion of Plumstead, the parliamentary borough of Greenwich, which returns two members. The ancient Incorporation of the Master and Brethren of the Trinity House of 'Deptford Strond,' founded by Henry VIII., has its hall at D., and also two sets of alms-houses. Queen Elizabeth, in 1581, visited Drake at D., in the ship in which he 'compassed the world.' In 1698, Peter the Great acquired the art of ship-building in the dock-yard here, residing at the manor-house of Sayes Court, which John Evelyn had previously occupied.

**DEPTFORD DO'CK-YARD**, as one of the royal naval establishments, is not so remarkable for ship-building as for other operations connected with the fitting-out of fleets. There are five building-slips—one for first-rates, three for frigates, and one for sloops; and there are two docks for frigates. The Victualling Establishment is an important place, employing several hundred persons as officers, clerks, workmen, and hoymen. This is the chief dépôt for victualling the home and foreign stations, and the marines; also for slops and many of the necessaries for seamen; and for barrack-stores. It is convenient for these purposes in being near the metropolitan markets. The officers receive, examine, store, pack, re-issue, and register the various stores, and transmit all their accounts to the Admiralty. For simplicity, we call this collectively a royal dock-yard; but the ship-building, the store-keeping, and the provisioning are the work of distinct establishments.

**DEPU'CH ISLAND**, a member of the Dampier Archipelago, lies off the north-west coast of Australia, in lat. 20° 38′ S., and long. 117° 44′ E. Though only eight miles in circuit, yet it is, on more than one ground, worthy of notice. On it have been found some curious specimens of native sculpture; and, rising with its greenstone rocks to a height of 514 feet above the sea, it presents a remarkable contrast to the low-lying shore of the adjacent mainland.

**DE'PUTY**, one who exercises power which properly belongs to another who has placed him in his stead. The appointment of a deputy does not free the principal from responsibility, for the deputy is not an assignee. It is a general rule, that no judge can appoint a deputy unless he be authorised to do so in the commission by which he himself is appointed. In the rare cases in which a deputy is empowered to appoint a deputy, the latter is usually called a substitute. See SHERIFF.

**DE QUINCEY**, THOMAS, a distinguished English writer, was born in Manchester, August 15, 1786. His father was a wealthy Manchester merchant, who, dying while his children were yet young, left his widow a fortune of £1600 a year. De Q. received his first education at home, and was afterwards sent to the grammar school of Bath. He proceeded to the university of Oxford in 1803, and remained there till 1808. At the university, he made the acquaintance of opium, which was ever afterwards his dread familiar. On leaving college, he went to reside at the Lakes, and formed one of the cluster of literary lights which made that region at the time so illustrious, and afterwards so memorable. He left Cumberland in 1819, and in 1843 he came to reside in Scotland, settling with his family at the village of Lasswade, near Edinburgh. He died at Edinburgh on the 8th December 1859.

With the exception of a strange episode of his youth, described in the *Confessions of an Opium-eater*, the heroine of which was, singularly enough, one of the 'waifs of womanhood,' De Q.'s career was almost entirely eventless. He led a lonely and a speculative life, and his writings are at once history and autobiography. He was perhaps, with the exception of his friend Professor Wilson, the most brilliant magazine-writer in this century of magazines. Everything he wrote, putting aside the *Confessions*, *The Logic of Political Economy*, and a novel, which no one seems to have read, or if read, to have remembered, is in the form of articles. Even the *Confessions* themselves were originally published as a series of articles in the *London Magazine*. De Q. has written on a great variety of subjects, and in a great variety of styles. He has written articles pervaded by humour of the most curious and novel kind, philosophical and critical articles distinguished by originality and daring of speculation, and articles of the nature of prose-poems, which are unquestionably of their kind the most wonderful things in English literature. In point of imaginative grandeur, and music and sweep of sentence, the *Suspiria de Profundis*, and the opium visions that close the *Confessions*, are miracles of impassioned prose. De Q.'s works were first collected and republished in America. Between the years 1853 and 1859, Messrs Hogg and Son of Edinburgh brought out an edition, founded to some extent on the American one.

**DERAJA'T**, the fluvial portion of Daman (q. v.), itself a comparatively narrow strip between the Suliman Mountains and the Indus, is, when duly irrigated, singularly fertile. It is so called from *dera*, a camp, which is a common element in the names of its four chief towns—Dera Deen Punah, Dera Futti Khan, Dera Ghazee Khan, and Dera Ismail Khan. These places are all built on or near the right bank of the Indus, in Afghanistan.—1. Dera Deen Punah, apparently the least considerable of the whole, has suffered much from physical causes, having, in 1819, been nearly destroyed by an earthquake and by a simultaneous flood from the Suliman Mountains.—2. Dera Futti Khan is the centre of a district which produces cotton, grain of various kinds, indigo, sugar, and opium. Pop. 5000.—3. Dera Ghazee Khan, the most important of the number, occupies, for commercial purposes, a very favourable position—the intersection of the two great routes of the country between north and south, and between east and west. Hence it has been recommended as the best site for an annual fair, so as to suit at once Sinde, the Punjab, Afghanistan, Beloochistan, and Khorassan. Besides manufactures in cotton, silk, and steel, it has a bazaar of 1600 shops. Pop. said to be 25,000.—4. Dera Ismail Khan, next in consequence to Dera Ghazee Khan, is a new creation, another town of the same name having, a few years ago, been swept away by an inundation of the bordering river. It stands on the thoroughfare already mentioned between north and south, commanding also two ferries across the Indus. To this position it is indebted for a thriving trade, and, more particularly in spring, it is crowded by the Lohani Afghans, an enterprising tribe of pastoral pedlers. Pop. 8000.

**DERBE'ND**, or **DERBE'NT**, a town of Russia, capital of the government of the same name, is situated on the western shore of the Caspian Sea, on the declivity of a branch of the Caucasus, which here approaches very close to the water's edge, and forms a defile anciently known as the *Albaniæ Pylæ*, now called the Pass of Derbend. Lat. 42° N., long. 48° 15′ E. D. is built in the form of a parallelogram, being about three miles in length, and from a quarter to half a mile in breadth. It is surrounded by strong walls of very ancient date, which are further strengthened at intervals by towers. From two massive iron gates, through which the road to the interior passes, the town derives its name, which signifies 'the shut-up gates.' The harbour of D. is quite inaccessible to all but small boats. The manufactures of the place consist chiefly of coarse silk and woollen stuffs. Pop. 12,870. D. is a very ancient place, having, as it is said, been fortified by Darius I. to prevent the incursions of the Scythians; and it was long considered the key of Persia on the north-west side. It came finally into the possession of Russia in 1795.

**DE'RBY**, the titular name of a distinguished family of the British aristocracy, descended from a common family with the Barons Audley or Audleigh, county Stafford. William de Audleigh, on exchanging with his cousin, Sir Adam de Audleigh, the manor of Talk, county Stafford, for that of Stanleigh (Stony Lea), county Derby, adopted the latter name, and continued it to all his descendants. This event occurred in the 12th century. The first who assumed the arms now used by the family —viz., 'three stags' heads on a bend'—was Sir William de Stanley, son of William de Stanley, who flourished in the reign of Henry III. The first Lord Stanley was created in 1456; his eldest son Thomas was created first Earl of Derby in 1485.

**DERBY, EDWARD GEOFFREY SMITH-STANLEY, 14th EARL OF**, was born, 1799, at Knowsley Park, Lancashire. He was educated at Eton and Christchurch, where, in 1819, he gained the Latin Verse prize (subject, *Syracuse*). He was elected member of parliament for Stockbridge in 1820; in 1825, he married the second daughter of the first Lord Skelmersdale; and in 1826, he represented Preston, but lost his seat in 1830, on becoming Chief Secretary for Ireland under the administration of Earl Grey. A seat was then found for him at Windsor. He took a distinguished part in the debates in favour of the Reform Bill, and signalised his Irish administration by two bold measures—one for National Education in Ireland, and another relative to the Irish Church Temporalities, which resulted in ten Irish bishoprics being abolished. The grievance of church-rates and first-fruits was also removed, and a graduated tax upon benefices and bishoprics substituted. In 1833, he became Secretary of State for the Colonies, and in the same year carried the bill for emancipating slaves in the West Indies, and providing a compensation of twenty millions to the planters. In 1834, being alarmed by the success of Mr Ward's motion for appropriating the surplus of the Irish Church temporalities to secular purposes, Lord Stanley seceded from the Grey ministry, carrying with him Sir James Graham, the Duke of Richmond, and the Earl of Ripon. He has ever since adhered to the Conservative party, although, in 1834, upon the dismissal of the Melbourne ministry by William IV., he declined to join the administration of Sir Robert Peel. After acting in concert with the opposition for seven years, he accepted the colonial seals in the Peel administration of 1841, and held them for four years. In September 1844, he resigned his seat for North Lancashire, for which he had sat since 1832, and was called to the Upper House in his father's barony of Stanley of Bickerstaffe. In December 1845, when Sir Robert Peel determined to repeal the corn laws, he retired from the cabinet. In 1846, he put himself at the head of the Protectionist opposition, which, headed in the Commons by Lord George Bentinck and Mr Disraeli, waged a stout but ineffectual opposition to the free-trade measures of Sir Robert Peel. He was now regarded as the leader of the great Conservative party. In 1851, on the death of his father, he succeeded to the earldom. In February 1852, on the resignation of Lord John Russell, he was sent for by the Queen, and intrusted with the formation of an administration, which was, however, displaced in December following by a hostile vote of the House of Commons condemnatory of the budget of his Chancellor of the Exchequer, Mr Disraeli. On the death of the Duke of Wellington in 1852, he was elected to the post of Chancellor of the University of Oxford. In February 1858, when the Palmerston government resigned on the rejection of the Conspiracy Bill, he again became First Lord of the Treasury. At the meeting of parliament in the following year, his government brought forward a measure of Parliamentary Reform. A hostile amendment having been moved by Lord John Russell, and carried, he dissolved parliament, and appealed to the country. When the new House of Commons re-assembled in June 1859, a vote of want of confidence was carried against his government, and he resigned. In May 1860, he took an active part in the rejection of the Paper Duty Abolition Bill, which was resented by the Commons as a breach of their constitutional privileges. As a debater, he stands in the very first rank. Lord Macaulay remarked, that his knowledge of the science of parliamentary debate, at the very outset of his career, resembled an instinct, and that it would be difficult to name any other debater who had not made himself a master of his art at the expense of his audience. His power of invective is almost unequalled, and his vehement contentions with Mr O'Connell on the Repeal of the Union and the Irish Church in 1833 and subsequent years, did much to diminish the influence which the great Irish agitator had previously exercised on English politics. He is tall, of commanding gesture, and his voice, in elevated passages of declamation, rings with trumpet-like power and effect.

**DE'RBY**, a parliamentary and municipal borough and manufacturing town, the capital of Derbyshire, in the south part of the county, in the wide and fertile valley of the Derwent—thence navigable to the Trent—at the junction of the main branches of the Midland Railway, 132 miles north-north-west of London, and 35 miles north-north-east of Birmingham. The houses are mostly of brick, and the public buildings of stone. The Free Grammar School is one of the oldest English foundations, reaching to 1162. Here Blackwell, author of the *Sacred Classics*, was a master, and Flamsteed a pupil. Dr Darwin, in 1783, founded the Philosophical Society of D., and wrote most of his works here. D. is well situated for manufacture and trade, being at the south end of a coal-field, and being connected by canals and railways with a great part of England. It has manufactures of silk, cotton, lace, hosiery, lead, iron, paints, porcelain, jewellery, black marble vases, columns, chimney-pieces, and ornaments of fluor-spar, petrifactions, marble, &c. The staple manufacture is throwing silk, introduced by Mr Crochet from Italy early in the 18th c.; the silk-mill, with machinery still in use, erected in 1718 by John Lombe, being the first and largest of the kind in England. Pop. (1861), 43,091. D. returns two members to parliament. It seems to have been the Roman station *Derventio*, which stood on the east bank of the river, opposite the present town. Roman brass, silver, and gold coins have been found here, as well as a Roman pavement, and the foundations of a Roman bridge over the Derwent. D.—called *Northworthige* by the Saxons, and *Deoraby* by the Danes—was given by the Conqueror to William Peverill; obtained the privilege of dyeing cloth from Edward III.; and was occupied by the Pretender in 1745. Richardson the novelist, and Flamsteed the astronomer, were born here. Here Justice Brent first called George Fox a Quaker. Jedidiah Strutt invented the ribbed stocking-frame here in 1756.

**DERBY DAY** is the second day, the Wednesday, of the Grand Spring Meeting, which takes place at Epsom in Surrey, in May, in the week succeeding Trinity Sunday. Upon this day, the most important on the list, and that on which the best horses run, the famous Derby stakes, instituted by the Earl of Derby in 1780, and which consist of 50 sovereigns each, are contended for. When the first Derby was run for, there were only 36 subscribers at 50 guineas each (with £25 forfeit in case of non-starters); but the number of subscribers is now so large, that the value of the stakes in 1861 amounted to £6500. The Derby Day is the great English holiday. To be present at Epsom on that occasion, London empties itself, and proceeds to the Downs by modes of locomotion the most heterogeneous. For hours, a continuous stream of carriages, gigs, dog-carts, vans, and vehicles of every description, moves tumultuously along the road to Epsom. Shopkeepers on that day shut up their shops, the benches of parliament are deserted, one-half of the aristocracy appear on the ground, people of every condition arrive in countless numbers from all districts; and huge trains arrive every few minutes at the station, bringing their thousands, until the entire Downs are covered with a vast moving mass. So great is the demand for conveyances on this day, that scarcely a horse can be had either in London or within 40 miles of it. At the Derby in 1861, the course, which is a mile and a half in length, was gone over in 2 minutes 43 seconds—swifter running, by 2 seconds, than any hitherto known on that course.

**DE'RBYITES.** See Plymouth Brethren.

**DE'RBYSHIRE**, an inland county of England, the twenty-first in size, lying between Yorkshire on the north and Leicestershire on the south. Its shape is triangular; its greatest length from north to south, 56 miles; greatest breadth, 34; area, 1030 square miles, of which above $\frac{5}{6}$ths are either arable, in pasture, or in meadow. No English county has such variety of scenery. The north-west is occupied by the south end of the Penine chain, called the High Peak or Derbyshire Highlands, composed of carboniferous limestone. This tract forms the water-shed between the Trent and Mersey, and is not surpassed for rugged and romantic scenery by anything in England; abounding in precipices, faults, rocking-stones, caverns—one of which is 2700 feet long—and streams that often lose themselves for a time among the fissures of the limestone hills. The Peak, the loftiest hill in D., is 2000 feet high. From the Peak tract, a range runs south; another runs 60 miles south-south-east. Other ranges intersect parts of the county. To the south, D. sinks into a flat or gently undulating tract of new red sandstone, with some spots of magnesian limestone and coal, and beds of red marl and gypsum. The chief rivers are the Trent—dividing D. from Staffordshire for 10 miles, and then crossing the south of the county and passing into Nottingham—and its tributaries, the Derwent and the Dove, both of which rise in the region of the Peak, and flow in a south-easterly direction. Warm mineral springs exist at Buxton and Matlock, and intermitting springs at Barmoor and Tideswell. D. is celebrated for metals and minerals—iron, lead, zinc, manganese, copper, coal, fuller's-earth, mineral caoutchouc and mineral oil, gypsum, pipe-clay and chert for potteries, marble, fluor-spar, and alabaster for ornaments, &c. D. has six canals, and is intersected by many branches of the Midland Railway. In the north, the climate is cool and moist, with fogs, and often frosts in summer. D. is more a manufacturing and mining than an agricultural county. The best soils in the south are red, marly, fertile loams. There are many woods and coppices. The chief crops are wheat, barley, and oats. D. has much permanent pasture, large dairies, and sheep-pasturage in the Peak district. There are manufactures of cotton, silk, worsted, metallic goods, porcelain, and marble and spar ornaments. D. is divided into 6 hundreds, 9 poor-law unions, and 140 parishes in the diocese of Lichfield. The chief towns are Derby, Ashbourne, Bakewell, Buxton, Chapel-le-Frith, Chesterfield, Belper, and Wirksworth. In 1851, pop. 296,084 (in 1861, 339,377); 840 schools, with 37,271 scholars; 776 churches—250 being of the Church of England, and 404 Methodist. D. returns six members to parliament—four for the county, and two for Derby. There are in the county remains of so-called Druid circles, barrows, cromlechs, British and Roman roads, Roman baths, and a Roman altar at Haddon Hall. There are also ecclesiastical and monastic remains. Repton Church crypt is older than 874. Hardwick Hall contains some furniture of Elizabeth's time, and some embroidery said to have been done by Mary Queen of Scots. Near Bakewell is Chatsworth, the magnificent seat of the Duke of Devonshire. Arkwright built his first mill at Cromford, in 1771. Brindley was born at Turnstead; and Strutt, the inventor of ribbed stockings, at Normanton.

**DERBYSHIRE SPAR** is a name given to the fluoride of calcium, or Fluor-Spar (q. v.).

**DERE'CSKÉ**, a town of Hungary, 12 miles south of Drebreczin. It is situated in the vicinity of several small lakes, from which, in the summer-time, a considerable quantity of soda is obtained by evaporation. In one of the lakes, small but very beautiful pearls are found. Pop. 5320.

**DE'REHAM**, East, a town in the middle of the county of Norfolk, 16 miles west-north-west of Norwich. Its streets are wide, well lighted, and well paved. The church, which is cruciform, with a tower, contains the remains and monument of Cowper the poet. D. has manufactures of agricultural machines, and in the highly cultivated country around there are many gardens and orchards. Pop. (1861), 4315. Here Withburga, daughter of King Anna, founded a nunnery in the 7th c., which was burned by the Danes, and afterwards refounded. Withburga was buried in her nunnery in 654, but her remains were stolen thence by the monks of Ely in 974.

**DE'RELICT**, a term in English Law, signifying anything forsaken or left, or wilfully cast away. Derelict lands, if suddenly left by the sea, belong to the crown; but if the sea has receded gradually and imperceptibly, the gain will go to the owner of the adjacent lands.

In order to constitute a ship which has been wrecked derelict, it is necessary that the master and crew shall have abandoned her, without hope of recovery. The mere quitting of a ship for the purpose of procuring assistance from the shore, or other temporary cause, with the intention of returning to her again, is not an abandonment. See Lord Stowell's judgment in the case of the *Aquila* (1 Rob. 37), and *Abbot on Shipping*, p. 489. When such abandonment or dereliction has occurred, the first-comers are entitled to take temporary possession of the ship, and to claim salvage, either from the owners, the lord of the manor, or other person having right to wrecks unclaimed by the owners, or in the event of no claim from the crown. The general superintendence of all matters relating to wreck is placed in the Board of Trade by the 439th section of 17 and 18 Vict. c. 104, commonly called 'the Merchant Shipping Act;' and the board may, with consent of the Commissioners of her Majesty's Treasury, appoint any officer of customs, or of the coast-guard, or other person, to be a receiver of wreck in any district, and to perform the duties imposed on him by the act. These duties consist in taking the command of the persons present, and availing himself of their services to the best of his ability to save the ship and her crew and cargo. If any one refuses to obey him, he shall incur a penalty of £50; and if any master of a ship or boat shall refuse him his aid, or any proprietor of a wagon, cart, or horses shall refuse him the use of them, he shall incur a penalty of £100. All articles washed on shore or lost are to be delivered to the receiver, and he has power to suppress plunder and disorder by force. Within 48 hours after taking possession of any wreck, the receiver shall cause to be posted up in the nearest custom-house a description of the same, and of any marks by which it is distinguished; and if the value of such wreck exceeds £20, he shall transmit a similar description to the secretary of the committee of Lloyd's (s. 452). See Lloyd's. Goods deemed perishable he may sell immediately (s. 453). The owner of all wreck is entitled, within one year, to claim it from the receiver, who will deliver it up to him on receiving payment of such expenses, fees, and salvage as may have been incurred in terms of the act (s. 470). In the event of no owner establishing his claim before the expiration of a year from the date at which the wreck has come into the possession of the receiver, it shall be delivered up to the lord of the manor or other person having title to it. If a dispute arise as to the property of wreck, or the amount of salvage or other charge due, it may be decided by two justices, whose proceedings may be reviewed by any court of law or equity, if carried there by appeal within three months. If no claim shall be established to wreck either by an owner or lord of the manor, or admiral, mayor, or other person having title to wrecks cast on shore at particular parts of the coast, the wreck becomes the property of the crown, and shall be sold by the receiver, and the proceeds, after deducting fees and expenses, paid into her Majesty's exchequer (s. 475).

The principle upon which Salvage (q. v.) is given on wrecks and derelict is, that a person who by his labour preserves goods which the owner or those intrusted with the care of them have either abandoned in distress at sea, or are unable to protect and secure, is entitled to retain the possession of the goods until proper compensation is made to him for his trouble. Where the parties cannot agree on this sum, and are unwilling to adopt the decision of the justices, as above stated, the amount is generally ascertained by a jury. Till the question is decided, the goods remain in the custody of the salvor, or of the receiver for his behoof. No claim for salvage is due where the owner, or those in his employment, are at hand on the coast, and in a condition to save and protect his property. If any one set of persons have taken possession of a derelict, and are endeavouring to bring it into port and save it, another set have no right to interfere with them and become participators in the salvage; unless it appears that the first in possession would not have been able to effect the rescue of the property without the aid of the others (Abbot, p. 490). This rule applies to king's officers, even where the property saved is government stores. The original salvors cannot be dispossessed without reasonable cause. As to the proportion which the salvage allowed bears to the value of the property saved in various circumstances, see Salvage.

**DERG**, Lough (signifying the *red lake*), the name of two Irish lakes. One, the largest lake expansion of the river Shannon, between Tipperary on the south-east, and Galway and Clare on the north-west, is 24 miles long from north-east to south-west, 2 to 6 broad, 10 to 20 feet deep at the upper, and 50 to 80 at the lower end. Its surface is about 100 feet above the sea. It contains several islands.—The other Lough Derg is in the south of Donegal county, on the borders of Tyrone. It is 3 miles by 2½, has many small isles and rocks, and wild dreary shores, and is surrounded by mica-slate hills 700 to 1200 feet high. Saint's Isle contains the remains of a priory, founded about 600, and is the original seat of St Patrick's Purgatory. But the place of penance has for some centuries been on Station Isle—under an acre in extent, and with two chapels—which is now the most celebrated place of pilgrimage in Ireland, 10,000 to 15,000 persons flocking to it annually, from 1st June to 15th August, for prayer, fasting, and vigils.

**DERIVA'TION.** See Etymology.

**DERIVATION**, in Medicine, a method of curing disease, by which it was formerly supposed that the *materies morbi*, or matter of the disease, was drained away through some channel established for it by artificial means, as when a blister is applied over an inflamed lung, or a discharge from the bowels established in a case of dropsy. Without too closely scrutinising the theory, it may be admitted that many of the practices founded on it have also a pretty firm basis of experience, and are well established in modern medicine.

**DERMATO'LOGY** (Gr. *dermatos*, of the skin, *logos*, a discourse), the science of the management of the skin and of its diseases. See Skin.

**DERMATOPHYTES** (Gr. *derma*, the skin, and *phyton*, a growth or plant), vegetable growths, chiefly of the lowest of Cryptogamia (q. v.), inhabiting the cuticle or epidermis, and giving rise to some forms of skin-disease, as Favus (q. v.), Pityriasis (q. v.), Ringworm (q. v.), &c.

Bacon Beetle (*Dermestes lardarius*).

**DERME'STES**, a genus of coleopterous insects of the section *Pentamera*, and of the family *Clavicornes* (q. v.); having antennæ shorter than the thorax, their three terminal joints forming an ovate compressed club. Their larvæ feed mostly on dry and decaying animal matter, and are very voracious, committing great ravages among furs, collections of natural history, &c. *D. lardarius* is the well-known Bacon Beetle, the larva of which is so often destructive to bacon and other dried meats, and often also to cheese. The perfect insect is about a quarter of an inch in length, and of a dull black colour, the base of each wing-cover ash-coloured with three black spots. The larva is of a long shape, tapering towards the tail, dark-brown above, white beneath, with long hairs, and furnished with two horny hooks on the last segment. The larva of *D. murinus* is common in the dried carcasses of vermin nailed up on doors by gamekeepers; that of *D. vulpinus* abounds among cargoes of hides brought from warm climates; that of *D. paniceus* in long-kept stores of ship-biscuits.

Use is sometimes made of the larvæ of species of D. for procuring well-cleaned skeletons of birds and other small animals: the animal is first soaked in water, to get all the blood out; then dried, to suit it to the taste of the larvæ, which are placed with it in a covered box; and in a short time their work is very neatly and completely done, much better than by ants.

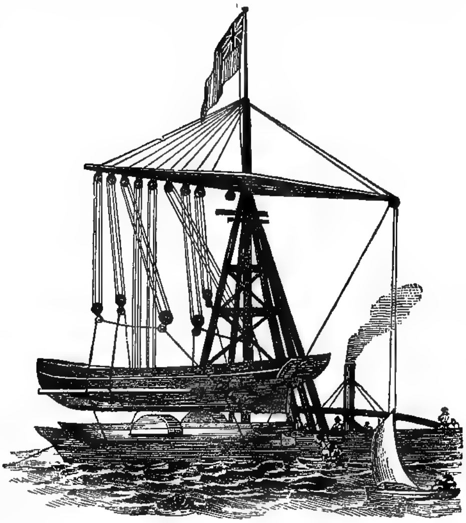
DE'RMIS. See Skin.

**DERMO'PTEROUS** (Gr. skin-finned) **FISHES**, an order of fishes in Owen's classification, so named from the cutaneous vertical fins, in which the rays are extremely soft and delicate, or altogether imperceptible, and further characterised by the want of pectoral and ventral fins. Lampreys, the lancelet, &c., are dermopterous fishes.

**DE'RNA**, or **DE'RNAH**, a town of Tripoli, Northern Africa, situated at the mouth of a ravine a mile from the Mediterranean, in about lat. 33° 30′ N., long. 22° 30′ E. Built on both sides of the ravine, it has regular streets, which are far from cleanly, although a copious stream of pure water flows through several of them. The houses are low, and have a mean appearance, but they are surrounded by fine gardens and orange-groves. The harbour of D. is insecure, and its prosperity, which was formerly considerable, has now greatly declined. Pop. 6000.

**DERREY'EH**, El, or **DERAY'EH**, a town of Nedjed, Central Arabia, in lat. 25° 15′ N., long. 46° 30′ E. It is fortified, and has a population usually stated at about 15,000. It was formerly the capital of the country of the Wahabees, but was captured and almost destroyed by Ibrahim Pasha in 1819.

**DE'RRICK**, a mechanical contrivance used for the same purposes as the crane, but recently so improved in size, strength, and mechanism, as to be able not only to raise a body of 1000 tons in weight, but to transport it from one place to another. The following description of the *Great Floating Derrick*, built in 1859, will convey an idea of the powers of this machine, and of the principles upon which it works. This derrick was built by the Thames Iron Ship-building Company, at Blackwall. It consists of a flat-bottomed vessel, 270 feet long, and 90 feet across the beam, and is divided throughout into a number of water-tight compartments, which can be filled, so as to counterbalance any weight on an opposite side. From the deck of this floating steam-crane rises an iron tripod 80 feet high, on the top of which revolves a gigantic boom, 120 feet long, and above the boom the 'king-post,' a continuation of the tripod, rises to the height of 50 feet. One arm of the boom is furnished with ten fourfold blocks; the chains attached to these blocks are passed across the king-post, brought over the other arm of the boom, and so descend to the other side of the vessel, where they are connected with two powerful steam-engines, by means of which the weights are raised. This derrick is capable of being propelled by means of a series of bucket-paddle floats at the rate of four miles an hour. It is the invention of Mr Bishop, an American. Derricks have been long in use in America, and have proved much more expeditious and economical than any other species of lifting-power. They are chiefly used for lifting machinery or other great weights, and for raising wrecks.



Lifting of the *Foreingen* and *Water Sprite* by the New Patent Derrick.

**DE'RVISH** is a Persian word signifying *poor*, corresponding to the Arabic *Fakir* (q. v.). It designates, in Mohammedan countries, a class of persons resembling in many respects the monks of Christendom. The dervishes are divided into many different brotherhoods and orders. They live mostly in well-endowed convents, called Tekkije or Changah, and are under a chief with the title of a Sheik, i. e., 'elder.' Some of the monks are married, and allowed to live out of the monastery, but must sleep there some nights weekly. Their devotional exercises consist in meetings for worship, prayers, religious dances, and mortifications. As the convent does not provide them with clothing, they are obliged to work more or less.

Dervishes.

It is difficult to say when these religious orders took their rise. From the earliest times, pious persons in the East have held it to be meritorious to renounce earthly joys, to free themselves from the trammels of domestic and social life, and to devote their thoughts in poverty and retirement to the contemplation of God. In this sense, poverty is recommended by Mohammed in the Koran. Tradition refers the origin of these orders to the earliest times of Islam, making the califs Abubekr and Ali found such brotherhoods; but it is more probable that they arose later. Many Mohammedan princes and Turkish sultans have held dervishes in high respect, and bestowed rich endowments on their establishments; and they are still in high veneration with the people. The orders are generally named after their founders, and the best known are the *Bestamis*, established 874 A. D.; *Kadris*, 1165; *Rufaji*, 1182; *Mevelevis*, 1273; *Nakshibendis*, 1319; *Bektashis*, 1357; *Rushenis*, 1533; *Shemsiss*, 1601; and *Jemalis*, 1750.

**DE'RWENT**, one of the principal rivers of Tasmania, issues from Lake St Clare, in the centre of the island; flows tortuously towards the south-east; waters Hobart-Town, the capital; and enters Storm Bay, in D'Entrecasteaux Channel, by an estuary of four miles in width. Up to Hobart-Town, the D. is navigable for ships of any burden. The lat. and long. of the mouth are about 42° 53′ S., and 147° 25′ E.

**DE'RWENTWATER**, or **KE'SWICK LAKE**, an oval sheet of water in the south of Cumberland, and one of the most beautiful of the lakes of that county. It stretches south from Keswick, is 3 miles long by 1½ broad, 72 feet deep, and 222 feet above the sea. Its banks are rocky and abrupt, and behind them rise rocky mountains, one of which, the Cat Bells, is 1448 feet high, and another, Lowdore, has a fall of 100 feet. This lake is an enlargement of the Derwent river, which runs through the lake in its course towards the Irish Sea, into which it flows at Workington. It has several wooded isles, besides a remarkable floating isle—a mass of earthy matter six feet thick, and varying in size in different years from an acre to a few perches, covered with vegetation, and full of air-bubbles, which buoy it on the surface of the water. D. abounds in trout, pike, perch, and eels.

**DERWENTWATER**, James, Earl of, one of the leaders in the rebellion of 1715, and the last Earl of D., was the descendant of an ancient Northumberland family named Radcliff. He was born in 1688, educated in France, and on the death of his father in 1705, D., then in his 17th year, returned to the seat of his ancestors at Dilston, in Northumberland, and assumed the paternal titles and estates. On the eve of the insurrection, at the close of 1714, warrants were issued on suspicion against several gentlemen in the north of England, and one, among others, against the Earl of D.; but having been previously warned, he fled from Dilston, and found refuge in the cottage of one of his dependents. He soon afterwards collected a few retainers, and placed himself at their head, under the impression that the entire body of the Jacobites either had risen, or were about to rise. From this period the history of the Earl of D. becomes the history of the Rebellion of 1715, which ended in the disastrous encounter at Preston, on which occasion D. conducted himself with the utmost heroism, but, with the most of the rebel leaders, was taken prisoner, and conveyed to the Tower of London. Having been impeached of high treason at the opening of parliament, he was carried before the House of Lords, February 9, 1716, and, requesting time to prepare an answer to his accusation, was remitted till the 19th, when, being taken for trial to Westminster Hall, he pleaded guilty, and threw himself upon the mercy of the king. His appeal was unavailing, and he was condemned to suffer. Every possible effort was made by the relations and friends of D. to obtain a pardon, but their exertions were fruitless, and he was beheaded on Tower Hill, 24th February 1716. His youth, his invariable amiability of temper, his rank, and his bravery, combined to excite great sympathy for the unhappy sufferer.

**DERZA'WIN**, Gabriel Romanowicz, a celebrated Russian lyric poet, was born at Kasan, 3d July 1743, studied at the gymnasium of his native city, and in 1762 entered the army as a private soldier. His talents and superior education soon procured him promotion. The Empress Catharine highly esteemed him; and in 1791, appointed him Secretary of State; in 1800, Imperial Treasurer; and in 1802, Minister of Justice. This last office, however, he held for only one year, when he retired on a pension, and devoted the remainder of his life wholly to the muses. He died 6th July 1816. D. is a thoroughly original poet. He excels in loftiness of idea, purity of sentiment, and rich vigour of language; in fact, the latter quality at times manifests itself in an Oriental extravagance of imagery which the colder fancy of the West fails to appreciate. D.'s noblest, as well as his most popular ode, is his *Address to the Deity.* It has been translated into English, German, and other European languages. His collected works were first published at St Petersburg in 5 vols. (1810—1815), and have been often reprinted since.

**DESAGUADE'RO**, the name of various waters in Spanish America, of which the chief are a lake and two rivers.—1. The lake, situated in Araucania (q. v.), measures 35 miles in length, with an average breadth of five, and sends forth the Osorno to the Pacific.—2. A river of the Argentine Confederation, separates the departments of San Luis and Mendoza. It is, however, merely a winter torrent, being quite dried up in summer.—3. A river of Bolivia—the only stream of any magnitude that is wholly within its borders—issues from Lake Titicaca, and, after a south course of 190 miles, loses itself in the land-locked lake of Aullagas, near the town of Oruro. It is, without exception, the loftiest stream of any length on either continent, for the elevation of its source, not greatly exceeding that of its mouth, is 12,846 feet, or nearly 2½ miles.

**DESAIX DE VEYGOUX**, Louis Charles Antoine, a general of the first French republic, was born at St Hilaire-d'Ayat, in Auvergne, August 17, 1768. After studying at the military school of Effiat, he was appointed in 1792 aide-de-camp to Prince Victor de Broglie, then at the head of the army of the Rhine. Here D. distinguished himself by his bravery, which was at the same time cool and fearless. In 1796, Moreau, having obtained the command of the army of the Rhine, made D. his lieutenant, and employed him in the most difficult and dangerous missions. In Moreau's (q. v.) famous retreat through the Black Forest during this year, D., who commanded the left wing of the army of the Rhine, increased his already great reputation. The French by this retreat had now retired within the Rhine, retaining on the right bank only the fort of Kehl, which D. was commissioned to defend. The fort was in ruins, and could not be well repaired before the approach of the Austrians; nevertheless, behind this imperfect defence D. resisted the Austrian army for more than two months, only capitulating in January 1797, when his ammunition was spent. His greatest achievement, however, was the conquest of Upper Egypt, which he accomplished in 1799, after an eight months' campaign. He was incredibly fertile in resources, and possessed the power of winning and restraining the people whom he had conquered, to a wonderful degree; his own soldiers used to compare him to Bayard, while the inhabitants named him *The Just Sultan.* D. returned from Egypt just in time to take part in the battle of Marengo, on the 14th June 1800, in which he was killed by a musket-bullet. His body was placed—after being embalmed—in the convent of Mount St Bernard. A statue has been raised in his honour in the Place Dauphine, in Paris.

**DE'SCANT, or DI'SCANT** (Sp. *discante*), a term which, in ancient times, was given to a musical composition; also to the counterpoint or melody which the singer (taking the upper part), sung extempore to the tenor or bass. In modern music, the term is applied to the part written for the voices of females or boys, and is the same as treble or soprano.

**DESCARTES,** René (Latinised into Renatus Cartesius), the name of one of the reformers of philosophy, was born March 31, 1596, at La Haye, in Touraine. He was sent at the age of eight years to the Jesuit College at La Flèche, where he soon became distinguished for his keenness of intellect, and made great and rapid progress in languages, mathematics, and astronomy. It was not long, however, before he became dissatisfied with the doctrines and method of scholasticism, and felt it impossible to acquiesce in what had hitherto been regarded as *knowledge.* The first thing that he did after leaving college, as we are informed in his treatise on Method, was to abandon books, and endeavour to efface from his mind all that he had hitherto been taught, that it might be free to receive the impressions of truth, whencesoever they should come. In pursuance of his plan, he resolved to travel, and soon entered the army as a volunteer, serving successively in Holland and Bavaria. As, however, the life of a soldier contributed little to his main object, he quitted the army in 1621; and after making journeys in different directions, he at last retired to Holland, where he prepared most of his works, attracted many disciples, and at the same time became involved in several learned controversies, especially with the theologians. Although he loved independence, yet, in 1649, he accepted an invitation to go to Sweden, addressed to him by Queen Christina, who desired his learned intercourse and instruction. His willingness to leave Holland was partly occasioned by his anxiety to escape from the hostility of his enemies. Only a few months after his arrival at the court of Queen Christina, he died on February 11, 1650. Sixteen years later, his body was brought to Paris, and buried in the church of St Genevieve-du-Mont.

The grand object towards which D. directed his endeavours, was the attainment of a firm philosophical conviction. The way whereby he sought to attain this end, is explained in the Discourse on Method (*Discours de la Méthode*, published in 1637), to which we have already referred. This small, but extremely interesting and important treatise, contains a history of the inner life of the author, tracing the progress of his mental development from its commencement in early years, to the point where it resulted in his resolution to hold nothing for true until he had ascertained the grounds of certitude. The author also, in the same treatise, explains the practical rules whereby he resolved to be guided while in this state of *suspended belief*, and by the observance of which he hoped to arrive at *absolute certainty*, if, indeed, it were at all attainable. The results of his inquiries, so conducted, he exhibited more particularly in his *Meditationes de Primâ Philosophiâ* (Amst. 1641), and the *Principia Philosophiæ* (Amst. 1644). In the former of these treatises, the independence of his thinking is strikingly brought out by his commencing his Meditations with the expression of doubt with regard to all that had hitherto borne the name of knowledge. After examining thoroughly, as he thought, the grounds of certitude in the various departments of knowledge, he found one, and only one proposition that seemed to him to stand the test, and of which the truth could not possibly be doubted: that proposition was, that he existed, which he inferred from the fact of his possessing consciousness. He could not doubt that he felt and thought, and therefore he could not doubt that *he*, the feeler, the thinker, existed. This relation between consciousness and existence he expressed by the memorable words: *Cogito, ergo sum.* Instead, however, of making the above proposition the foundation of his philosophy, by which he would have been led into a direction similar to that of Kant or Fichte, he employed it only so far as to ascertain from it the criterion of certitude—viz., that whatever is *clearly and distinctly thought, must be true.* Amongst these clear and distinct thoughts, he soon recognised the idea of God as the absolutely Perfect Being. This idea, he reasoned, could not be formed in our minds by ourselves, for the imperfect can never originate the perfect; it must be *connate*, i. e., part of the original structure of our understanding, and implanted there by the Perfect Being himself. Hence, from the existence of the idea of perfection, D. inferred the existence of God as the originator of it; he inferred it also from the mere *nature of the idea*, because the idea of perfection involves existence. But if God exist, then we have a guarantee of the previously determined ground of certitude, for God the Perfect Being cannot deceive, and therefore whatever our consciousness clearly testifies, may be implicitly believed.

The most general fundamental principle of the philosophical system of D., is the essential difference of spirit and matter—the thinking and the extended substances—a difference so great, according to D., that they can exert no influence upon each other. Hence, in order to account for the correspondence betwixt the material and spiritual phenomena, he was obliged to have recourse to a constant co-operation (*concursus*) on the part of God; a doctrine which gave rise subsequently to the system called Occasionalism (q. v.), the principle of which was, that body and mind do not really affect each other, God being always the true cause of the apparent or occasional influence of one on the other. This doctrine received its complete development in the pre-established harmony of Leibnitz. See Leibnitz.

D. did not confine his attention to mental philosophy, but devoted himself systematically to the explanation of the properties of the bodies composing the material universe. In this department, his reforms amounted to a revolution, though many of his explanations of physical phenomena are purely *a priori*, and certainly sufficiently absurd. His corpuscular philosophy—in which he endeavoured to explain all the appearances of the material world simply by the motion of the ultimate particles of bodies—was a great advance on the system held up to that time, according to which special qualities and powers were assumed to account for every phenomenon. It was in mathematics, however, that D. achieved the greatest and most lasting results; and, indeed, his mathematical discoveries procured among his contemporaries, for his, in many cases, wild philosophical views, a greater importance than they in themselves are entitled to. It was D. who first recognised the true meaning of the negative roots of equations; and we owe to him the theorem, which is called by his name, that an equation may have as many positive roots as there are changes of sign in passing from term to term, and as many negative roots as there are continuations of sign, and not more of either kind. He gave a new and ingenious solution of equations of the fourth degree; and first introduced *exponents*, and thereby laid the foundation for calculating with *powers*. He shewed, moreover, how to draw *tangents* and *normals* at every point of a geometrical curve, with the exception of mechanical or transcendental curves; and, what perhaps was his highest merit, he shewed how to express the nature and the properties of every curve, by an equation between two variable co-ordinates; thus, in fact, originating *Analytical Geometry*, which has led to the brightest discoveries. D. was less happy in his cosmological exercitations, in which he attempted to explain the movements of the heavenly bodies by *vortices* (*tourbillons*), consisting in the currents of the ether which he supposed to fill the universe; a theory which not only then, but even after the discoveries of Newton, made a great noise, and found many adherents, but which has long ago been consigned to oblivion. The philosophical and mathematical works of D., which are composed in Latin, were published at Amsterdam (9 vols. 4to, 1692—1701, also in 1713), and at Paris (1724—1726, in 13 vols. 12mo). More recently, an edition of his whole works has been published by M. Cousin (11 vols., Paris, 1824—1826).

**DESCE'NDANTS.** See HEIR, COLLATERAL, &c.; SUCCESSION.

**DESCE'NT,** LINE OF SWIFTEST, is that by which a body falling under the action of gravity, passes most quickly from one point to another. It is proved that, when the one point is not directly over the other, the line of swiftest descent is an arc of a Cycloid (q. v.).

**DE'SERET.** See UTAH.

**DE'SERT** (*desertus*, solitary), a term used to denote any portion of the earth's surface which, from its barrenness, as in the case of the arid plains of Northern Africa and Arabia, or from its rank exuberance, as in the case of the *Silvas* of South America, is unfitted to be the site of great commercial and industrial communities. Many names, each differing in meaning to some extent, are employed to designate the desert-plains of different countries. The *Desert* proper may be said to signify the vast sandy plains of Africa and Arabia; while the flats extending from the Black Sea on the north, and from Persia on the south, onward across Tibet and Tartary to the north-eastern coasts of Asia, are called *Steppes;* those in the northern division of South America, *Silvas* or desert-forests; those in the other portions of South America, *Llanos* and *Pampas;* and those in North America, *Prairies* or *Savannahs.* All these, though widely differing in individual characteristics, have in common the important physical features of wide extent and uniform general level. The *Oases*, which are occasional spots in the desert where springs arise, and where the waste is enlivened by the presence of vegetation, are usually lower than the general level of the surrounding plain. The great and famous desert-ground, however, is to be found in the Old World. A huge tract of comparatively rainless country stretches almost continuously from the North Atlantic to the shores of the North Pacific, thus forming a great belt of sand from east to west, along the whole extent of the eastern hemisphere. Beginning from Cape Nun on the north-west coast of Africa, the *Great Sahara*, the grand type of all desert-grounds, stretches away eastward from the shores of the Atlantic to the banks of the Nile, its eastern division being frequently called the desert of *Libya.* Crossing the Nile, by the irrigation and inundations of which alone Egypt is preserved from subsiding into the waste condition of the surrounding country, the desert is again found, interposing a strip of hot sand between the right bank of the Nile and the western border of the Red Sea, upon whose shores no rain ever falls. On the right shore of the Red Sea, desert-grounds unvisited by any rains prevail over the greater portion of Arabia, and stretch onward, with occasional interruption, over Persia, Tibet, and the Tartaries. The most extensive desert in the eastern portion of these arid districts is called the Desert of Gobi, which extends from the western extremity of Tibet north-east to the shores of Lake Baikal. The cause of this extraordinary zone of parched land, and of similar smaller tracts in other parts of the world, will be best explained under the head of RAIN.

**DESE'RTAS,** the general name of three rocky islands in the Atlantic Ocean, situated to the south-east of Madeira, in lat. 32° 31′ N., long. 16° 30′ W. The southern and largest island is called Bugio; the centre one, Deserta Grande; and the northern, Chão. Deserta Grande has a length of six miles, with a breadth of from half a mile to one mile; Chão and Bugio are only about a mile in length—the latter about the same in breadth, but the former not more than a quarter. The D. are not inhabited, but they yield considerable pasturage, and are visited at certain seasons of the year by fishermen and herdsmen.

**DESE'RTION FROM THE PUBLIC SERVICE OF THE COUNTRY** is the crime of a man absconding, during the period for which he is enlisted, from the service of the army or navy. This crime was, by certain old statutes, made punishable with death; but now the punishment for desertion is prescribed by the annual Mutiny Acts. By 23 Vict. c. 9 and 10, any court-martial may inflict a sentence of corporal punishment, not exceeding fifty lashes, for desertion, and may in addition award imprisonment for the period prescribed by the articles of war. By 20 Vict. c. 13, s. 35, and 22 Vict. c. 4, s. 35, it is provided that deserters may be marked on the breast in gunpowder or ink with the letter D. This provision is omitted in the Mutiny Act, 1860. Recruits deserting before they have joined their regiments, are to be taken to the regiment nearest to the place where they were found, but to suffer no punishment except loss of bounty. Inducing to desert was formerly punishable by death; the punishment has, by modern statutes, been commuted to penal servitude. If simply 'absent without leave,' a British soldier, besides undergoing some kind of punishment, forfeits his regular pay for the days of absence; but if his non-appearance involves actual desertion, he loses all claim to additional pay, good-conduct money, and pension. The number of deserters from the British army is very great. In one particular period of eight months, from October 1, 1857, to March 31, 1858, no less than 8822 men deserted from the regular army, and 6614 from the militia; and recent experience points to 20,000 as a probable yearly average at present. Many experienced officers attribute the evil to the temptations of bounty, rather than to any other cause (see BOUNTY); and advise that the same amount of money should be applied to the soldier's benefit in some other form.

Desertion is equally a crime when committed by a seaman of the royal navy as by a soldier. A sailor absent from three successive musters is a 'runaway;' and when discovered and brought back, his punishment consists in a deduction of his wages. If his absence is continued, it amounts to desertion. All harbouring of deserters by other persons is punishable. The year 1860 was marked by great and scandalous desertions from the royal navy; the cause is very obscurely known, but is generally referred to some points of superiority in the merchant-service, which tempt the seamen away from their duty.

**DESERTION OF SPOUSE.** Before the passing of the Divorce and Matrimonial Court Acts, there existed in England no means whereby a wife, wilfully deserted by her husband, could obtain redress. By 20 and 21 Vict. c. 85, and 21 and 22 Vict. c. 108, desertion by either spouse is made a ground of judicial separation; and desertion coupled with adultery, is a ground for dissolution of marriage. The same acts make provision for the protection of property acquired by a wife who has been deserted. In an action for divorce on account of adultery, it is no bar to the action that the husband has deserted his wife. Morgan *v.* Morgan, Curtis ii. 686.

In Scotland, where the wife deserts the husband, she forfeits her claim to aliment; but in the event of her contracting debt for necessaries, the husband will be liable in payment, unless he shew that the tradesman was aware of the separation. It is said that she may claim her legal provision of terce on the husband's death, though she have deserted him. A husband deserting his wife, continues liable to aliment her. It appears to be doubtful whether *simple desertion* of a wife by her husband is a ground for judicial separation. But if either party shall, without just cause, have abandoned the conjugal society of the other for four years together, a decree of divorce will be pronounced at the instance of the deserted spouse (1573, c. 55), Fraser *On Domestic Relations*, 458, 680. See DIVORCE; SEPARATION JUDICIAL, OF MAN AND WIFE.

**DESERTION OF THE DIET.** See DIET, DESERTION OF.

**DESI'CCANTS,** in Medicine, are substances with astringent properties, which are serviceable in checking secretion and exhalation.

**DESICCA'TION** is the process of drying by the employment of heat, dry air, or chemical agents which have an affinity for water. Examples of the class of *desiccants* or drying substances are fused chloride of calcium, quicklime, fused carbonate of potash, and oil of vitriol. The latter is employed by being placed in a separate vessel near the substance to be dried, and under a bell jar.

**DESI'GN,** a preliminary work, either in outline or colour, in which the conception of the artist is indicated, and more or less fully expressed. The design ought to exhibit the whole composition and drawing of the work, though the last only in a general way. The design ought thus to be a correct, though not a complete representation of the future work. When colours are employed in a design, it is rather tentatively, and for the purpose of ascertaining what their effect will be, than with a view to actually producing the effect required. A sketch differs from a design, inasmuch as the former is generally applied to a first drawing from an object placed before the artist; the latter, to a first drawing of an object which he has imagined, either wholly, or in the attitude and combinations in which he represents it. In Architecture, the term is applied to a drawing mathematically correct, but in which the effects to the eye which will ultimately be produced by distance and by light and shade, are altogether ignored. An architectural design is consequently scarcely intelligible on first sight.

Designing on wood for wood-cuts or engravings is now a distinct profession, followed by a class of artists. A design of this kind consists of a drawing in pencil on the wood, the effects being as closely as possible what the printed engraving is intended to represent. See WOOD-ENGRAVING.

**DESIGN,** GOVERNMENT SCHOOLS OF. The object of these schools is to communicate to artisans and manufacturers, and above all, to the designers whom manufacturers employ in the preparation of patterns and models, such an acquaintance with the principles and practice of the fine arts, as may be brought to bear on manufactures. The idea of their founders was, that by training artisans in this manner, greater symmetry of form, harmony and richness of colour, and appropriateness of decoration, might be given to the ordinary objects of everyday use which it was their occupation to produce. The effort was not in opposition to, but in direct accordance with, the principles of an enlightened utilitarianism, for it was hoped that not only the direct and primary function of each object might thus be performed as well, or better, but that it might be made to serve the indirect and secondary, but not less important office of refining and purifying public taste, and thus of adding to the sum of human happiness. Even the ethical side of the question was not overlooked. It was remembered that the good and the beautiful are intimately related, and it was hoped that not only enjoyment but virtue might be thus promoted. With these high objects in view, a central School of Design was established at Somerset House in 1837, and branch-schools have since been opened in almost every town in the kingdom. These schools are managed by the Committee of Council on Education, through the intervention of the Department of Science and Art, the offices of which are now situated in the Cromwell Road, South Kensington. In connection with the schools of design, it was very soon found necessary to establish classes for elementary drawing, it being fruitless labour to attempt to teach the more advanced branches of art to persons who were ignorant of its first principles. It was also felt that, before a general demand for good designs could be created, the large body of the public, who form the purchasers, must be instructed in the general principles of art. Impressed with the necessity of an acquaintance with elementary drawing for the accomplishment of their ultimate object, and entertaining strong opinions as to its value as a branch of general education, the Department of Science and Art resolved to throw their drawing-schools open to the public, on the payment of merely nominal fees. These schools are now attended by large numbers of persons of all classes, and nothing can exceed the precision and accuracy of the instruction which is communicated in their elementary classes. In the more advanced stages, however, their pupils seem to make little progress; and the water-colour paintings which they exhibit, both of flowers and landscapes, are inferior to those of many private drawing-schools. The following is an abridgment of the arrangements by which assistance in promoting the teaching of elementary drawing, &c., and in establishing local schools, is afforded by the Committee of Council on Education, taken from the *Directory for* 1860, issued by the Science and Art Department:

'*Establishment of a National Training-school of Art.*—1. A Central Training-school, for the benefit of the United Kingdom, is established at South Kensington, to which male and female students are admitted when properly qualified, receiving an allowance in aid of their maintenance which is proportioned to their attainments and to their qualifications for the duties of teaching required from them. When such students have obtained the requisite certificates of qualification, they are recommended as teachers to the local Schools of Art throughout the United Kingdom; and as long as they perform their duties to the satisfaction of the local committees managing the schools which appoint them, and afford instruction to the poorer classes, they receive from the Department, in augmentation of their incomes, payments proportioned to competency and successful results of teaching.

'*Establishment of Local Art-schools or Drawing Unions.*—2. A School of Art or Local Union for obtaining instruction in drawing, can be formed wherever the public provides and maintains, at its own liability, suitable premises. Towards the erection of new premises the Department is authorised to make grants not exceeding 25 per cent. on the cost; and an Art-master will be recommended by the Department, on condition that five public schools for the poor, or 500 poor children are found, to whom drawing may be taught; that pupil-teachers of public schools for the poor are taught at a low charge, and that an evening class is held three times a week at a fee not exceeding 6*d*. a week. As these payments are insufficient to support a master, the local committee must shew that there is a reasonable prospect of his obtaining a livelihood in teaching drawing to other classes, private schools, &c.

'*Annual Local Inspections.*—3. At every School of Art or Local Union for teaching drawing, an annual inspection and examination are held by the Department, at which medals and prizes are awarded to students, including those in public schools for the poor, and payments proportioned to the success of the results are made to the teacher.

'*National Competition.*—4. The drawings and works of art executed in local schools, which have obtained medals, are brought together once in the year, for competition with each other at an examination held at South Kensington, when Queen's prizes and national medallions are awarded to the most successful students; and to the Schools of Art where they have been instructed, works of art and publications to the value of £10 for each Queen's prize or national medallion, are presented. These examinations, as well as all others conducted by the Department, are open to all persons, whether taught by an Art-master or otherwise.

'*Circulation of Examples and Books from the Central Museum.*—5. Every local School of Art is privileged to borrow objects of art from the Museum, and valuable examples, books, &c., from the Library at South Kensington, both these institutions being, as far as possible, circulating institutions, for the benefit of the United Kingdom.

'*Grants for Purchase of Examples.*—6. All Schools of Art, public schools for the education of the poor, and mechanics' and other institutions for artisans, may obtain from the Department grants in aid of purchasing examples, models, casts, and other apparatus for art instruction.'

**DESI'GNS**, Copyright in. Designs for articles, whether of ornament or utility, are protected by various statutes. Of these, the most important are the Act to consolidate and amend the Laws relating to the Copyright of Designs for ornamenting Articles of Manufacture, of 1842 (5 and 6 Vict. c. 100), since amended by 21 and 22 Vict. c. 70. By the latter of these statutes, the protection which the former had granted for nine months, is extended to three years, to be computed from the time when the design was registered. By section 5, it is provided that the registration of any pattern or portion of an article of manufacture to which a design is applied, instead of, or in lieu of, a copy, drawing, print, specification, or description in writing, shall be as valid and effectual as if such copy, drawing, print, specification, or description in writing had been furnished to the registrar under the Copyright of Designs Act. The other statutes are 6 and 7 Vict. c. 65, 13 and 14 Vict. c. 104, 14 and 15 Vict. c. 8, and 15 and 16 Vict. c. 6.

The copyright of paintings, and pictorial representations generally, is considered to be in an unsatisfactory state, and a bill is now (1861) before parliament, brought in by the attorney-general, to amend the law on the subject. See Pictures, Copyright of.

**DESIRA'DE, or DESIDERA'DE, or DESEA'DA**, the first of Columbus's discoveries during his second voyage, lies about 4 miles to the east of Guadeloupe, of which, under France, it is a political dependency. It measures 6 miles by 2, and contains 2568 inhabitants, among whom are 2070 emancipated slaves. The surface is elevated in proportion to the area, and the soil, though not generally fertile, is yet said to yield excellent cotton.

**DE'SMAN.** See Musk Rat.

**DESMIDIEÆ**, according to the prevalent opinion of naturalists, a tribe or group of *Algæ*, and as such ranked by some botanists among *Diatomaceæ* (q. v.); whilst other naturalists regard them as belonging to the animal rather than to the vegetable kingdom, some also esteeming them to be vegetable who maintain the animal character of the true *Diatomaceæ*. They are amongst those lowest organisms which seem to connect the animal and vegetable kingdoms at their common starting-point. The D. are readily distinguished from the true *Diatomaceæ* by their rounded—not angular—form, and by their want of silicious covering; also by their colour, which is a herbaceous green, whilst the *Diatomaceæ* are generally brownish. Unlike the *Diatomaceæ*, they shrivel up, and lose their form in drying. They are, like them, microscopic, but are usually found in stagnant or very slowly running water, sometimes in brackish, but never in salt water. They may often be procured in great numbers, by pouring the water in which they exist upon a cloth; and if the cloth is kept moist, they will live for a long time, and their progress may be observed. They all exhibit a transverse constriction, sometimes not very distinct, but often almost dividing the single cell which forms the organism into two parts. It is at this constriction that new cells are formed; but this process ceases after a while, and a true reproduction takes place by spores, either through Conjugation (q. v.) or Swarming (q. v.). It is very much on account of these modes of reproduction, and of the presence of starch in the D., that they are confidently referred by naturalists to the vegetable kingdom. Our knowledge of the D. has been much extended by the work of Mr Ralfs on the *British Desmidieæ.*

**DESMO'NCUS**, a genus of palms, with slender stems, climbing over shrubs and trees, like the Rattans (*Calamus*) of the East Indies. They are the only American palms of this character. They have alternate pinnate leaves, with long hooked spines instead of several of the uppermost leaflets, which make them very formidable to those who attempt to penetrate the forests where they grow. The species are pretty numerous, and all American.

**DESMOULINS**, Camille, one of the prominent personages of the French Revolution, was born in 1762 at Guise, in Picardy; studied law at the Collège Louis-le-Grand, Paris; but on account of a stutter in his speech, did not prosecute the profession. His mind was filled with lofty but confused notions of classical republicanism, which found vent on the eve of the Revolution in his *La Philosophie au Peuple Français* (Par. 1788), and *La France Libre* (Par. 1789). To his exaggerated denunciation was owing that outburst of popular fury which resulted in the destruction of the Bastile on the night of the 14th July 1789. In the events of the Champ de Mars, August 10, 1792, D., like his friend Danton, took a leading part, but was less implicated in the September massacres. Elected to the National Convention by the people of Paris, he voted for the death of Louis XVI. His relation to Danton, which had always in it something of dependence, induced him to take up the pen against the Girondists, and in his *Histoire des Brissotins*, he covered these moderate republicans with ridicule. In this, however, D. was not quite sincere, for many of the Girondists he highly esteemed, and he was himself by nature much more like Vergniaud and Brissot than like Robespierre and St Just. When the guillotine was erected, D. saw his error, and bitterly repented his facile folly. Towards the end of 1793, he began to publish *Le Vieux Cordelier;* a journal which recommended, among other things, that the forms of justice should be restored, and attacked the members of the *Comité de Salut Public.* Twice accused before the Jacobin Club, he was at length, on the night of the 30th March 1794, along with Danton, arrested, and brought before the Revolutionary Tribunal. When asked his age, D. replied: 'J'ai l'âge du sans-culotte, Jésus, c'est-à-dire trente-trois ans, âge fatal aux révolutionnaires.' He was condemned without a hearing, and mounted the scaffold along with Danton, April 5, 1794. His wife, the beautiful Lucile Duplessis, vainly endeavoured to excite an insurrection in his favour, and a fortnight after, she also was executed.—D. was essentially an enthusiast and hero-worshipper, always leaning for support on some stronger spirit than his own. His first idol was Mirabeau, after whose death he devoted himself to Danton. His aspirations were noble, his sympathies magnanimous, but he had neither sufficient moral resolution to oppose the political excesses of the popular party, nor even, until the close of his career, sufficient insight to assure him of their injustice and folly. Gifted abundantly by nature, as the light-hearted Camille was, with wit, fancy, and feeling, one cannot help regretting that he did not live in less troublous times, when he might have given to the world, in the form of poesy or fiction, the treasures of his rich and sparkling genius.

**DE'SNA**, a river of Russia, rises in the government of Smolensk, 50 miles south-east of the town of that name. It flows south-east through the governments of Smolensk and Orel, until it reaches Briansk, where it enters the government of Tchernigov, through which it flows south, then south-west to the town of Tchernigov, and finally joins the Dnieper nearly opposite Kiew. The D. is 500 miles in length, and is navigable throughout almost the whole of its course. Its chief affluents are the Seim, from the left, and from the right, the Snov.

**DE'SPOT AND DE'SPOTISM.** A despotism is a form of government which has for its object the interests either of an individual or of a class, to the exclusion of those of the whole community. In the former case, it is usually called a Tyranny (q. v.), which is the degenerate form of monarchy; in the latter, it may be either an oligarchy, which is the degenerate form of aristocracy, or an ochlocracy, which is the degenerate form of democracy. A despot is the individual or class in whose favour and for whose benefit such a government is carried on. A despot may thus include any number of persons, from unity upwards—from a monarch to a mob. Much of the confusion which attends political speculation, and many of the disasters which befall political life in modern times, would be obviated, if these terms were used in the strictly scientific sense which was assigned to them by the Greek politicians more than 2000 years ago. See MONARCH, TYRANT, DICTATOR.

**DESSALINES**, JAQUES, some time emperor of the island of Hayti (St Domingo), was imported into that island from the Gold Coast of Africa as a slave. On the liberation of the slaves, 4th February 1794, he became one of the most prominent among the negroes who rose in insurrection against the white colonists. After the organisation of the insurrection, D. occupied the position of first-lieutenant to the leader Toussaint l'Ouverture; and in the wars against the French troops, was always distinguished by his agility and swiftness of movement, as well as by his fearlessness and ferocity. D. submitted, however, and took advantage of the amnesty granted on the capture of Toussaint in 1802; but shortly after he headed another insurrection, attacked the French forces, defeated them in the battle of St Mark, and compelled them to evacuate the island in October 1803. He was created governor in January 1804, when the people of the island declared themselves independent, and had himself crowned as Emperor of Hayti, 8th October of the same year, under the name of Jaques I.; but his despotism and cruelty soon alienated from him the sympathy and support even of those who were formerly his firmest adherents. On the 17th of October 1806, D. was attacked and killed by Christophe, a negro chief, who succeeded him as Emperor Henri I. of Hayti.

**DE'SSAU**, a town of Northern Germany, capital of the duchy of Anhalt-Dessau, is situated on the left bank of the Mulde, not far from its junction with the Elbe, about 80 miles by railway south-west of Berlin. D. is enclosed on three sides by walls, the river forming the protection on the fourth side. D. consists of three parts, the old and new town, and the Sand, and it has besides three suburbs. It is, in general, well built, and one or two of the streets are particularly handsome. Among the principal buildings are the ducal palace, a noble structure, built in 1748, with a picture-gallery, and a library, containing many MSS. of Luther, a town-hall, an elegant theatre, and several churches and benevolent institutions. Its educational establishments are numerous and excellent. It has a fine cemetery, and the environs are surrounded by beautiful gardens. The manufactures are woollen cloth, hosiery, tobacco, and spirits. Pop. 14,000.

**DE'SUETUDE**, a technical term in the law of Scotland, signifying that repeal or revocation of a legal enactment which is effected, not by a subsequent enactment in a contrary sense, but by the establishment of a contrary use, sanctioned by the lapse of time and the consent of the community. The corresponding term in English law is *nonuser;* but neither the word nor the idea attached to it is familiar to that system. The rule in England is, that a statute once formally enacted by the legislature, remains in force, however unsuited it may be to the altered conditions of society, till it be repealed by another statute. The repeal may be by implication, but here the law watches with a jealous eye. Such repeal 'is to be understood,' says Blackstone, 'only when the matter of the later statute is so clearly repugnant that it necessarily implies a negative. As, if a former act says that a juror upon such a trial shall have an estate of twenty pounds a year; and a new statute afterwards that he shall have twenty marks—here the latter statute virtually repeals the former.' So far was this principle carried, that it was formerly the rule, that if a statute repealing another was itself repealed afterwards, the first statute was revived without any formal words for that purpose. But this rule has been changed by 13 and 14 Vict. c. 21, s. 5 and 6, which enact that where any act repealing, in whole or in part, any former act, is itself repealed, such last repeal shall not revive the act or provisions before repealed, unless words be added for that purpose; and that where any act shall be made, repealing in whole or in part any former act, and substituting provisions instead of those repealed, such repealed provisions shall remain in force till those substituted shall come into operation by force of the last made act. In Scotland, an opposite principle prevailed, and it is still held that acts of parliament made before the Union may lose their force by disuse, without any express repeal, or 'go into desuetude,' as it is commonly said. But by desuetude is meant something more than mere non-use for a period of time, however great. There must be contrary use of a positive kind, inconsistent with the statute, and of such a kind as to prove the altered sense of the community; there must, in short, be consuetudinary law in a negative sense; and the so-called desuetude thus amounts to a repeal of statute law by consuetudinary law. Both rules are liable to objections. The result of that followed in England has been, that statutes have remained on the statute-book without formal repeal, after their enforcement had become morally impossible. Of this it may be mentioned, as one single example, that the judicial combat was formally demanded in virtue of an unrepealed statute, and had in point of form to be conceded in the present century. See DUEL. In such cases, a virtual recourse to the principle of repeal by opposite consuetude becomes a matter of necessity, and the deficiency of the English law in point of principle is corrected in practice by the impossibility of administering it. The Scottish principle, on the other hand, though far more philosophical and reasonable in itself, scarcely admits of practical application; and the greatest difficulty has consequently been felt in determining what constitutes such contrary use as to support the plea of desuetude. The best arrangement probably would be, whilst retaining the Scottish rule as correct in principle, to endeavour, by purging the statute-book of all obsolete enactments, to render its practical application as limited as possible.

**DETA'CHMENT**, in Military matters, is a small but indefinite number of troops, sent for some special duties away from the regiment, brigade, division, or army, as the case may be. In a fleet, also, a detachment of one or more ships may be told off in a similar way.

**DETE'RMINANTS**, the name given to a new method of great use, *inter alia*, in the solution of equations embracing several unknown quantities, whereby the student can almost on inspection write down the values, in terms of the known quantities, of each of the unknown.

**DE'TINUE**, in English law, an action for the recovery of goods wrongfully detained, or their value, with damages and costs. The action is for the recovery of a specific article; the goods detained must, therefore, be of such a character that they can be distinguished from others, as a horse, money in a bag, &c. In this respect, the action of detinue differs from an ordinary action at law, and judgment in detinue is accompanied by its special remedy for enforcing execution—called writ of *Distringas*. There must actually be a title of property in the plaintiff at the time he brings his action; but property without possession is sufficient, and an heir can thus bring his action for an heir-loom which has never been in his possession. This action was formerly subject to *Wager of Law* (q. v.), now abolished, whereby the defendant was allowed to clear himself by his own oath, supported by that of eleven neighbours. This proceeding rendered the action of detinue so inconvenient, that, by a fiction of law, remedy for wrongful detention was most frequently sought by the action of *Trover* (q. v.).

**DE'TMOLD**, a town of North-western Germany, on the Werre, capital of the principality of Lippe-Detmold, 47 miles south-west of Hanover, consists of an old and new town, the latter of which is well built, and adorned with public walks and gardens. The chief buildings are the palace, a fine old castellated edifice surrounded by prettily arranged gardens, the gymnasium, and the theatre. D. has also a training-school, a public library, and a hospital. The manufactures are leather, woollens, and linens. There are also several breweries. Pop. 5232.

**DETONA'TION** is the phenomenon of combustion with explosive rapidity, accompanied by sound and light. Thus the firing of gunpowder, gun-cotton, and fulminating-powders, as in a percussion-cap, is detonation.

**DETRI'TUS**, applied in Geology to accumulations formed by the disintegration of rocks, which consist of gravel, sand, or clay, or of an admixture of them.

**DETROIT** (French for strait) is that part of the St Lawrence which discharges Lake St Clair into Lake Erie. With a south-south-west course, it forms the lowest section of that mighty body of waters before it assumes its north-east direction towards the gulf of its own name. It is about 28 miles long, with a minimum breadth of fully half a mile. Though the middle of its length is barely above the 42d parallel—about 550 miles to the south of any point in England—yet it is frost-bound for about four months in the year. It is navigable for vessels of any burden, the deeper channel, being on the Canadian shore.

**DETROIT**, the oldest city by far in the west of the United States, and older than either Baltimore or Philadelphia on the sea-board, was founded by the French of Canada in 1670, as an outpost for the prosecution of the fur-trade, on the right bank of the river of its own name. For more than a century and a half, however, the advantages of its position were rather prospective than actual. Even under American impulses, the settlement of the adjacent wildernesses was so slowly carried into effect, that Michigan, of which D. was the capital, continued to be a subordinate territory, as distinguished from a sovereign state, from 1805 to 1837. Accordingly, as late as 1830, the place contained only 2222 inhabitants. But in 1840, the population had risen to 9102; in 1850, it was 21,019; and by a local census of 1853, it stood at 34,436; and finally, notwithstanding the commercial crisis of 1857, the census of 1860 gave 45,619. The exports and the imports between them exceed 20 million dollars, or 4 million pounds; while the aggregate shipping cannot be less than 50,000 tons—more than the half being propelled by steam. Besides a net-work of navigable communications, which, with the aid of art, has added the open ocean and the Gulf of Mexico to the St Lawrence, D., to say nothing of plank-roads, now commands overland facilities to an extraordinary extent. Westward, the Michigan Central Railway leads to Chicago; while, eastward, the Great Western of Canada, after traversing the more fertile portion of that province, meets the Grand Trunk, which stretches its arms to Portland on the Atlantic. D. has a well-organised system of public schools. It is supplied from the river with water, which is forced into a reservoir 50 feet high. The manufactures are extensive and important, consisting of steam-engines and of machinery in general, of stoves, ploughs, cabinet-ware, &c. Brewing and tanning are also largely carried on.

**DE'TTINGEN**, a village of Bavaria, circle of Lower Franconia, on the right bank of the Maine; noted as the scene of a battle during the Austrian wars of succession. This conflict, in which George II. of England headed the army of the allies, while the Duke de Noailles acted as commander of the French forces, took place on the 27th June 1743, and was the last occasion in which a king of England appeared in person on the field. The army of the allies was composed of English, Hanoverians, Hessians, and some troops from the Low Countries, amounting in all to an active force of 37,000 men; while the French leader Noailles had an army of about 60,000. The former occupied a valley extending from Aschaffenburg to Dettingen. Before the fight, Noailles threw 12,000 men into Aschaffenburg, and so made it impossible for his opponents to retreat with safety. The defile of D. in front of the allies was also held by De Grammont with 25,000 men, while Noailles himself, shifting his position on the Maine, so as to command with his batteries the flank and rear of the allies, rendered their position so critical that George resolved to force his way through the enemy. It was his only chance; and fortunately for him, De Grammont rashly and foolishly left his position, rushed over the morass and rivulet in his front, and engaged. At this moment, George, dismounting, placed himself at the head of the British and Hanoverian infantry, flourished his sword, and shouted: 'Now, my boys, for the honour of England! fire; behave well; and the French will soon run!' Shock after shock from the impetuous French horse broke on the steady lines of infantry in vain, and at length George, forming his infantry into one solid column, advanced. Onward went the column, dense, steady, and overwhelming, breaking the squadrons of De Grammont, and driving horse and foot before them, until the enemy broke into promiscuous and bewildered retreat. Noailles's reserves were too late to be of any use: the allies had won the day. Many of the French were driven into the Maine, and so drowned; some were killed in the pursuit, which, however, was not prosecuted to any great extent. The loss of the French, in killed, wounded, and prisoners, was estimated at 6000, and that of the allies at 2000 men.

**DE'TVA**, a town in the north-west of Hungary, is situated in a deep valley, 20 miles east of Altsohl. Pop. 7240.

**DEUCA'LION**, according to the Greek myth, was a son of Prometheus, grandson of Iapetus, and husband of Pyrrha. When Zeus had resolved to destroy the race of men by a flood, D. built and provisioned, by the advice of his father, an ark or ship, which he entered along with his wife. The flood came, and all Hellas was submerged. D. floated about for nine days, and on the subsidence of the waters, the ark rested on Mount Parnassus. Other versions of the myth, however, make it rest on Mount Othrys in Thessaly, on Mount Athos, or on Mount Etna in Sicily. D. and Pyrrha, according to one account, now offered up sacrifice to Zeus *Phyxius*, i. e., Zeus, the protector of fugitives, and prayed that he would repeople the world, which he did; but the more common tradition was, that they went to the sanctuary of Themis for this purpose, and were told by the goddess that they must throw behind them the bones of their mother as they departed from the temple. Understanding by the 'bones of their mother' the stones of the earth, they obeyed the injunction, and from those thrown by D. sprang up men, and from those by Pyrrha, women. D. built his first dwelling-place at Opus or Cynus. He is also said to have founded the sanctuary of Olympian Jove at Athens, and in later ages his tomb in the vicinity was long pointed out. D. had by Pyrrha several children, Hellen, Amphictyon, Protogeneia, and others. It was at one time extensively believed, even by intelligent scholars, that the myth of D. was a corrupted tradition of the Noachian deluge, but this untenable opinion is now all but universally abandoned. The myth is a comparatively late one, being mentioned neither by Homer nor Hesiod.

**DE'US EX MA'CHINA**, an expression borrowed from the classical theatre. In conformity with the popular mythological beliefs of their age, the tragic poets of Greece, instead of bringing about the dénouement of their plots by natural means, had often recourse to a more expeditious mode—viz., the intervention of a god, who descended in a machine, and abruptly solved whatever difficulty barred the proper termination of the piece. As examples of the *Deus ex Machina*, take the appearance of Hercules in the *Philoctetes*, and of Diana in the *Iphigenia in Tauris*. In modern tragedy, when a person or incident is introduced arbitrarily, *forced*, as it were, into the conduct of a plot, merely to remedy some inartistic negligence in its construction, or to save the author the labour of further ingenuity, such a contrivance is metaphorically called a *Deus ex Machina*. In modern comedy, the rich old uncle who suddenly comes home from the West Indies, and rescues the young couple (hero and heroine) from their dreadful pecuniary embarrassment, serves exactly the same purpose. When a savant or philosopher cannot explain some fact of nature by any known law, and has recourse to the supposition of the direct and immediate action of God, his assumption is also termed by analogy a *Deus ex Machina*.

**DEUTERO'NOMY** (Gr. *Deuteronomion*, i. e., the second law) is the name given by the Septuagint translators to the 5th book of the Pentateuch, because it contains a repetition of the entire Mosaic legislation, with the exception of what pertains to the priesthood. It is commonly presumed to have been written by Moses himself, with the exception of the last four chapters, which narrate the closing events in the life of the great lawgiver in a biographical and not in an autobiographical spirit. Many critics, however, especially in Germany, affirm that the entire book itself in its present form is post-Mosaic. The repeated allusions to the kingdom, the prophethood, the temple at Jerusalem, places in Palestine which Moses never saw, and could not have known, as well as various other particulars, render it (it is alleged) probable that Deuteronomy is a late recension and enlargement of some Mosaic abridgment of the previous portion of the Pentateuch. That the work has a Mosaic basis, nevertheless, is indisputable, for the language in many parts is more lifelike, and partakes more of the personality of the author, than anything ascribed to Moses elsewhere. The style, in fact, except in the connecting narrative, is for the most part the exact opposite of a compiler's.

**DEUTO'XIDE.** See CHEMICAL NOMENCLATURE.

**DEUTZ.** See COLOGNE.

**DEU'TZIA,** a genus of shrubs of the natural order *Philadelphaceæ*, natives of the north of India, China, and Japan, some of which are now reckoned among the favourite green-house plants of Britain, in some situations even enduring the open air. They produce beautiful white flowers in great profusion. The leaves of *D. scabra* are so rough with silicious hairs, that they are universally used by joiners in Japan for polishing wood.

**DEUX-PONTS** (Ger. *Zweibrücken*), a town of Rhenish Bavaria, picturesquely situated among wooded heights on the Erbach, near its junction with the Serre, 34 miles west-north-west of Landau. D., which owes its name to the two bridges which there cross the Erbach, is well built, and has among its principal buildings a Lutheran cathedral, also the remains of an ancient ducal palace, now used as a Catholic chapel. Its manufactures are woollen and cotton cloth, hardware, leather, and tobacco. Pop. 7300.

D., or, in Latin, Bepontium (whence the name Bepontine given to the edition of Greek and Latin classics here printed by a society of scholars in 1779), is not mentioned in history till 1197, and was then in the possession of Counts of Deux-Ponts. After various changes of masters, it finally came into the possession of Bavaria.

**DE'VAPRAYA'GA,** a town in India, remarkable chiefly for its situation, stands in the fork of the Aluknunda and the Bhageerettee, whose united waters immediately assume the name of Ganges. It is in lat. 30° 8′ N., and long. 78° 39′ E., belonging to the protected state of Gurwhal; and its elevation above the point of confluence is 313, and above the sea, 2266 feet. Marking, as it were, the source of the sacred river, D. is a favourite place of pilgrimage for the Hindus; and, in fact, its only permanent population consists of about 1000 Brahmins from the Deccan. In connection with the holy character of the locality, are two ancient temples, a flight of steps in the rock down to the very brink of the mingled streams, and three basins excavated in the solid stone a little below the level of the surface of the current. The town was much shattered by an earthquake in 1803, but was subsequently repaired at the expense of Scindia, the Mahratta chief of Gwalior.

**DEVE'LOPMENT OF DOCTRINE** signifies the modifying process through which Christian or philosophical opinion passes in its transmission from age to age. At first comparatively simple in its expression, doctrine has a tendency to become more complicated and technical in structure as argument is exercised upon it, and the spirit of controversy excited. The difference between the doctrinal statements in the Pauline Epistles and the earlier creeds, such as that of Nicæa, the elaborate expositions of the medieval theologians, and again of the Protestant theologians of the 16th and 17th centuries, is a difference at once appreciable by the theologian, as it is full of interest to him. There is, beyond doubt, at these several points in the history of the church, a certain growth or extension of Christian opinion called forth by, and corresponding to, the exigencies of the times. This is what is meant by the development of Christian doctrine, and the name denotes with sufficient propriety an unquestioned series of phenomena.

It is true that the idea of development in doctrine is one of modern origin, unknown to the earlier dogmatic ages of the church. But this merely proves that it is only in recent times that the history of the church has been reviewed in a critical and philosophical spirit. The idea of development is modern in its application to science altogether, and especially to the science of history. The ground upon which it is vindicated, in its application to Christian doctrine, is, that this doctrine is not a mere repetition of Christian truth in the language of inspiration, but really the rational or argumentative exposition of this truth. It represents this truth as it appears to the Christian reason in different ages. It is the expression of what has been called the *Christian consciousness* working in contact with the text of Scripture. The Nicene doctrine of the Trinity, for example, is the definite explanation which the Christian reason of the 4th c. gave to the undefined and general expressions of the gospels and epistles as to the relation of the Father and the Son. The doctrine of the atonement, as a *satisfaction* to God for the sins of the world, is first clearly and explicitly unfolded by St Anselm in the 11th century. It is not meant that the elements of either of these doctrines are not to be found in Scripture, or that they are the product of human ingenuity; it is only affirmed that the scriptural elements in the one case and the other, were first clearly and argumentatively unfolded by the ingenuity of the Christian reason at these different times. The very idea of *doctrine* implies the employment of reason, the exercise of inquiry and argument upon the divine truth of Scripture. It is this truth analysed and reflectively given forth—not the mere equivalent of Scripture, but something derived from it by Christian investigation and culture. Such a process of investigation and culture is necessarily variable and progressive. The divine fact remaining the same, the human explanation or doctrine of it may and does greatly vary. The course of this variation—the rising and falling of the human apprehension of the meaning of Scripture—is the development of doctrine.

This view is to be distinguished from that which characterises the extreme subjective school of German theology. According to this school, Christian doctrine is nothing else than the expression of the Christian consciousness at any time. Scripture maintains no permanent or authoritative relation to it. It is all progress—a continued flux, without any normal standard or expression. Scripture may be its primary expression, but it may leave its fountain-head, and in the course of time issue in developments not necessarily bound to Scripture. But according to the view above set forth, Scripture remains the absolute and complete revelation of Christian doctrine, which is continually unfolded, but never exhausted by inquiry—beyond which right reason and truth never travel. The Christian revelation not only admits of, but demands constant criticism, as the means of unfolding more comprehensively and perfectly its contents, but it remains in itself the consummate expression of all spiritual truth; and it is this very peculiarity of the Christian revelation, that makes its contents capable of continual and ever fresh development. It is just because its substance is divine, that its doctrinal expressions never cease to interest and to answer to the necessities of successive times. Other religions, while capable of development, reach a point where they cease to have any further living meaning, and pass on the one hand into mere popular mythology, or into an esoteric priestly tradition. They become transmuted into poetry or some ordinary product of philosophical speculation. Civilisation overtakes and supplants them. But it is of the distinguishing divine character of Christianity that its doctrines possess a vital ever-renewing power, capable of adaptation to the highest forms of human civilisation, and full of enlightenment and guidance to the most advanced intelligence. The development of

Christian doctrine, therefore, is not merely a subject of curious and important study in the past, but of great and significant influence for the present and the future.

## DEVELOPMENT OF THE E'MBRŸO.

Harvey laid down the principle, in opposition to the views of those who believed in the doctrine of spontaneous generation, that all animals are produced from eggs (*omne vivum ex ovo*); and more recent researches have fully confirmed this view, if we are allowed to except the modes of reproduction known as *gemmiparous* and *fissiparous*, or multiplication by buds and propagation by division, and the series of cases in which the offspring never resemble their parents, but the original form reappears in the second generation, and which are consequently said to present the phenomena of *alternate generation*. These exceptional cases occur only in very low forms of animal life, and, as a general rule, in retracing the phases of animal life, we arrive at an epoch in which the incipient animal is enclosed within an egg. It is then termed an *embryo;* and the modifications which this embryo undergoes before the young animal has an independent existence, are included in the general term which stands at the head of this article. Before embryology was properly studied, all animals were arranged under two great heads—the *oviparous*, which lay eggs; and the *viviparous*, which bring forth their young alive. We now know that viviparous as well as oviparous animals are produced from eggs—the only difference in this respect being, that their eggs, instead of being laid before the development of the embryo, begin to undergo their early changes in the body of the mother.

The egg has generally a more or less spherical form; the eggs of birds have, however, the form of an elongated spheroid, narrow at one end, and hence the origin of the word *oval*. Some eggs, as, for instance, those of certain insects (e. g., the podurella), are furnished with projecting filaments; others have a sculptured surface; and others, again, have peculiar forms, being cylindrical or prismatic. A simple sphere is, however, the normal form.

The egg originates within organs termed *ovaries*, peculiar to and characteristic of the female, except in those cases in which both male and female reproductive organs are associated in the same individual. These ovaries are glandular bodies, and are usually situated in the abdominal cavity. So long as the eggs remain in the ovary, they are very minute, and in this condition they are called *ovarian* or *primitive eggs*. They are identical in all animals, being, in fact, merely little cells, containing yolk substance *b*, in which is enclosed the germinative vesicle *d*, and the germinative dot *e* (fig. 1). The yolk itself, with its membrane, is formed while the egg remains in the ovary; it is afterwards enclosed in another envelope, the shell-membrane, which may either remain soft, like parchment, or may be surrounded by calcareous deposit, as we observe in birds' eggs (see fig. 2). The number of eggs seems to increase in proportion as we descend the animal scale, the eggs laid by a bird being far fewer than those laid by a fish, while these again are less than those laid by some insects.

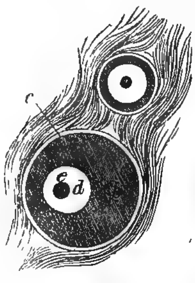


Fig. 1.—Ideal section of a Bird's Ovary:

*b*, the yolk; *c*, the vitelline or shell membrane; *d*, the germinative vesicle; *e*, the germinative dot.

The egg, when it has attained a certain degree of maturity, leaves the ovary. This step in the process is termed *ovulation*, and must not be confounded with the laying or deposition of the eggs, which is their subsequent expulsion from the abdominal cavity, through (in most cases) a special canal termed the *oviduct*. Ovulation takes place at a definite period of the year in most of the lower animals, and seldom until the animal has attained its full growth. In general, ovulation is repeated for a number of years consecutively, usually in the spring; sometimes, however, it occurs but once during life, as in most insects, which die soon after the process is accomplished.

After leaving the ovary, the eggs are either discharged from the animal, and undergo their further changes in the external world, or they continue their development within the body of the mother, as is the case in some fishes and reptiles (as sharks and vipers), which have consequently been named *ovoviviparous* animals; or, in the case of the mammalia, they are not only developed within the body of the mother, but, except in the case of the Marsupiata and Monotremata (q. v.), become intimately united to her by the intervention of certain temporary structures—namely, the placenta and umbilical cord. This mode of development is termed *gestation*.

The development of the embryo does not always take place immediately after the egg is laid, and a considerable time may elapse before it commences. Thus, the first eggs laid by the bird do not begin to undergo development until the whole number which is to constitute the entire brood is deposited; and the eggs of most insects are laid in the autumn, and remain unchanged till the following spring. During this time, the vital principle is dormant. See DORMANT VITALITY. In the case of birds and reptiles, a considerable degree of warmth is requisite for the process of development. In birds, the act of *incubation*, or 'sitting,' supplies the necessary amount of heat; and in reptiles, the eggs are hatched by exposure on sands to the sun's rays, by their being deposited in warm dunghills, &c.

We shall endeavour to illustrate the composition and structure of the egg by giving an ideal section of a hen's egg (fig. 2). In a newly-laid hen's egg—and of course the description equally applies to the egg of any other bird—we have exteriorly the shell, whose hardness is due mainly to carbonate of lime, and which is lined by a double membrane, the shell membrane, *c*; then there is an albuminous substance, the *white*, in which several layers may be distinguished, *e*, *f*; within this, we find the *yolk*, *h*, enclosed in its membrane; and in the midst of the yolk there was, before it was laid, a minute vesicle, the *germinative vesicle* (fig. 1, *d*) containing a still smaller one, the *germinative dot*, *e*. The most conspicuous of these parts—namely, the shell and the white—are not physiologically essential, and are wanting in the eggs of most animals lower than birds; while the yolk, the germinative vesicle, and the germinative dot, are found in the eggs of all animals; and it is from these parts, and these only, that the germ is formed. The *yolk* or *vitellus* is the most essential part of the egg. It is a viscid fluid,

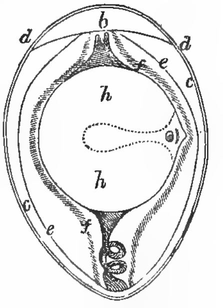


Fig. 2.—Ideal section of a Bird's Egg:

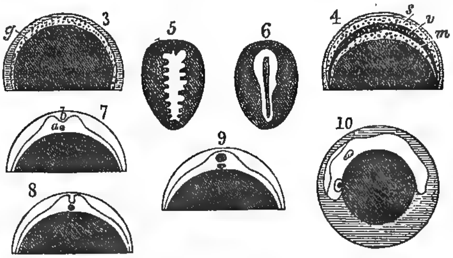
*b*, the space containing air at the large end; it is formed by the splitting of *c*, the shell-membrane at the points *dd*; *e*, *f*, layers of albumen; *h*, the yolk.

sometimes opaque and coloured, as in the eggs of birds, and sometimes transparent and colourless, as in the eggs of many fishes and molluscs. The microscope shews that it is composed of an accumulation of granules and oil-vesicles. The yolk is surrounded by a very thin skin, termed the *vitelline membrane* (fig. 1, *c*). In some insects, this membrane forms the outer coat of the egg.

The *germinative vesicle* (fig. 1, *d*) is a cell, situated in the young egg near the middle of the yolk; it contains one or more minute spots or nuclei, termed the germinative dots, *e*, which themselves contain smaller nucleoli. The *albumen* or *white* of the egg (fig. 2, *e e*, *f f*) is a viscid and colourless fluid, which coagulates and becomes opaque on the application of a temperature of 146° F. Although it forms a large part of the egg of the bird, it is of very trifling importance in reference to the development of the embryo. It is not formed in the ovary like the yolk, but is secreted by the oviduct, and deposited round the yolk during the passage of the egg through that canal; hence, when there is no oviduct, the albumen is generally absent. In birds, it consists of several layers, one of which, forming the *chalazæ*, presents a coiled, rope-like appearance. The albumen in this part is thicker than that which lies more externally. The albumen is bounded externally by the *membrana putaminis*, or *shell membrane*, *c*, which, at *d*, *d*, splits into two layers, leaving a space, *b*, at the broad end, filled with air; in birds, and in some reptiles, this membrane is covered by the calcareous shell; in most cases, however, it continues membranous, as in the eggs of the molluscs, most crustaceans, and fishes, frogs, &c.; and sometimes it is horny, as in the sharks and skates.

In order to understand the successive steps of embryonic development, we must remember that the whole animal body is formed of tissues, the elements of which are cells. See CELLS. While in the full-grown animal these cells have undergone such modifications as often hardly to present any indication of their primary form; in early embryonic life, the cells, which originate within the yolk, present a definite form and consistence. These cells we shall presently see become transformed into the blood, bone, muscle, &c., of the young animal. At the commencement of the process of development, the yolk, which previously was a mass of uniform appearance, gradually presents certain alterations. Some portions become more opaque, and others more transparent; and the germinative vesicle, which was in the centre, rises to the upper part of the yolk, where the germ is to be formed. The yolk at the same time undergoes a peculiar process of segmentation. It is first divided into halves, forming distinct spheres, which are again continuously and regularly subdivided into two, till the whole or a part of the yolk assumes the appearance of a mulberry, and is known as the 'mulberry mass.' In fishes, the class of animals whose development we shall specially follow in this article, the segmentation is only partial, the divisions of the yolk not extending into its whole mass. This process leads to the formation of a *germ*, which usually rises above the yolk in the form of a discoid protuberance, which has received the various names of germinative disc, proligerous disc, germinal membrane, &c., and which is composed of minute cells. This disc enlarges, till it embraces the whole, or very nearly the whole, of the yolk. At this early period, the germ consists of a single layer of very minute cells of uniform appearance (see fig. 3, *g*); it soon, however, increases in thickness, and in vertebrate animals separates into various layers, which gradually become more and more distinct (fig. 4). The upper layer, *s*, in this figure is termed the *serous* or *nervous layer*, and from it are subsequently developed the principal organs of animal life—such as the bones, muscles, brain and nerves, &c. The lower layer, *m*, gives origin to the organs of vegetative life, and especially to the intestines and chylopoietic viscera, and is called the *mucous* or *vegetative* layer; the cells of which it is composed are larger than those of the serous layer. Between these layers there is, in the vertebrata, an intermediate layer, *v*, giving rise to the organs of circulation and to the first-formed blood, and hence termed the *vascular layer*.

At a very early period, the germ undergoes modifications of form, varying with the department of the animal kingdom to which it belongs. Thus, in the articulata (insects, crustaceans, &c.), the germ is divided into segments, indicating the transverse divisions which occur in the adult animal (fig. 5); while the germ of vertebrate animals displays a longitudinal furrow, marking the position which the vertebral column and spinal cord are to occupy (fig. 6). The development of this furrow is highly important, as will be seen by a reference to figs. 7, 8, and 9, in which the egg is supposed to be cut through its centre, in a plane at right angles to its long diameter, so that only the section or cut surface is shewn, while the view in fig. 6 shews the whole course of the furrow as it extends over the yolk. At first, the furrow is very shallow (fig. 7, *b*), and a minute transparent band appears under it, called the *primitive stripe*, *a*. The walls of the furrow consist of two raised edges formed by a swelling of the germ on both sides of the primitive stripe. As these walls increase in height, their summits approach each other, as is seen in fig. 8; and after a time they unite, and convert the furrow into a closed canal (fig. 9), which is soon filled with a fluid from which the brain and spinal cord are subsequently formed.

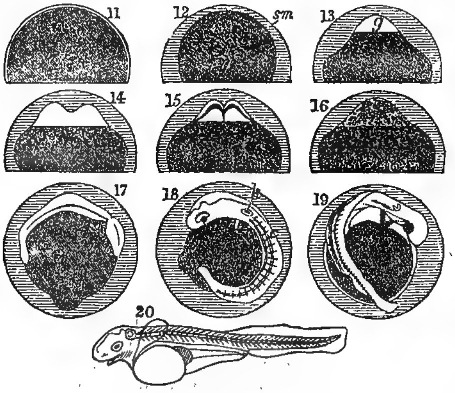


Figs. 3—10.

The primitive stripe is gradually developed into a cartilaginous structure, termed the *chorda dorsalis*, which is the representative of the back-bone. In the meantime, the margin of the germ continues to extend over the surface of the yolk, until at length the latter is entirely enclosed in a cavity thus formed by the germ. In this lower cavity, the intestines and other organs of vegetative life are subsequently developed.

In all classes of the animal kingdom, the embryo rests upon the yolk, and covers it like a cap; but the direction by which its edges approach each other and unite to form the lower cavity, is very different in different kinds of animals, and is highly distinctive in reference to zoological classification. In all the vertebrata, the embryo lies with its face or ventral surface towards the yolk (fig. 10), and thus the suture or line at which the edges of the germ unite to enclose the yolk, and which in mammals forms the navel, lies in front. Another suture is found along the back, arising from the folding together of the upper surfaces of the germ, to form the dorsal canal. In the affection known as *spina bifida*, this suture is incomplete. In the articulata, the embryo lies with its back upon the yolk; in the cephalopoda, the yolk communicates, as in the vertebrata, with the ventral surface of the body, but no dorsal canal is formed in them; and in the other departments of animal life, we find special and characteristic relations between the embryo and the yolk.

The development of the embryo of vertebrated animals is best observed in the eggs of fishes, as from their transparency they do not require to be cut open; and with due care the whole series of embryonic changes may be observed upon the same individual, and the succession of appearances of the different organs may be ascertained. Professor Agassiz has carefully examined and depicted the principal phases of development in the white-fish, which belongs to the salmon family, and we shall endeavour to give his chief results. The following magnified sections, copied from his plates, will shew the period at which the different organs successively appear. The egg when laid (fig. 11) is spherical, about the size of a small pea, and nearly transparent. It contains no albumen, and the shell membrane and the membrane of the yolk seem fused into one. In a few hours after it has been laid, provided it has come in contact with the fecundating fluid of the male, a separation between these two membranes takes place, in consequence of the absorption of water (fig. 12), by which the size of the egg is increased. Between the shell-membrane, *sm*, and the yolk, *y*, there is now a considerable transparent space, corresponding in position to the albumen of birds' eggs. Oil globules are scattered through the yolk, but soon arrange themselves in a stratum or disc towards the upper part, where a swelling, in the shape of a transparent vesicle (fig. 13, *g*), begins to shew itself. It is composed of very delicate and minute cells, and is the germ in its earliest stage. As the germ increases, and has a larger surface in contact with the yolk, we notice a depression on its upper part (fig. 14), and soon after a second furrow appears at right angles to the former, so that the germ now presents four elevations, as we have attempted to shew in fig. 15. A continuous subdivision of this nature goes on during the second and third days, until the germ is divided into numerous minute spheres, which form what is termed the mulberry mass (fig. 16). This appearance, however, does not long continue; at the end of the third day, the fissures disappear, and the germ continues to extend as an envelope around the yolk, which it at last entirely encloses.



Figs. 11—20.

On the tenth day, the first outlines of the embryo begin to appear, and we soon distinguish in it a depression between two little ridges, whose edges approach till they form a canal (see fig. 8). At about the same time, an enlargement at one end of the furrow is observed, which is the rudimentary head (fig. 17), in which may soon be distinguished traces of the division of the brain corresponding to the organs of sight, hearing, and smell.

Towards the thirteenth day, we see a transparent cartilaginous cord (the *chorda dorsalis*) in the position afterwards occupied by the back-bone, composed of large cells, in which transverse divisions are forming (fig. 18, *c*). In some fishes, as the sturgeon, this cartilaginous or embryonic state is persistent through life, and no true osseous vertebral column is ever formed. The rudiments of the eye soon appear in the form of a fold in the external membrane of the germ, in which the crystalline lens (fig. 18, *x*) is afterwards formed. At the same time we see at the posterior part of the head an elliptical vesicle, *k*, which is the rudimentary ear. At this period, the distinction between the upper (serous) and lower (mucous) layers of the germ is best traced; all the changes which have been mentioned occurring in the upper layer.

At or soon after the seventeenth day, the lower (or mucous) layer separates into two laminæ, the inferior of which becomes the intestine. The heart at about the same time appears in the form of a simple cavity (fig. 18, *h*) in the midst of a mass of cells belonging to the middle or vascular layer. As soon as the cavity of the heart is closed in (fig. 19, *h*), regular motions of contraction and expansion are observed, and the movement of blood-corpuscles within it is seen.

It is not till the thirtieth day that any traces of a circulation of the blood are manifested; we then notice two currents, one running towards the head, and the other towards the trunk (fig. 19), with corresponding returning currents. The traces of the liver are now seen. The embryo begins to liberate itself at both extremities from the yolk, the tail first becoming free, and moving in violent jerks.

The embryo, although still enclosed in the egg-membranes, now unites all the essential conditions for the exercise of the functions of animal life: it has a brain, an intestine, a pulsating heart, and circulating blood, and a limited amount of spontaneous motion; but the forms of the organs are still incomplete, nor have they acquired the precise shape characterising the class to which it belongs. The embryo is as yet only a vertebrate animal in general, and might be taken for that of a frog as well as for that of a fish.

Towards the close of the embryonic period, after the fortieth day, the embryo acquires a more definite shape: the jaws protrude; the nostrils approach the end of the snout; divisions are observed in the fin-like structure which surrounds the body; the anterior extremities, which were mere knobs, become rudimentary pectoral fins; and, finally, the gill-openings appear, so that the fish-type is now obvious. In this state, the young white-fish escapes from the egg about the sixtieth day after it is laid (fig. 20); but its development is still incomplete. We cannot yet tell to what genus the fish belongs. The gill-covers are not yet formed, there are no teeth, the mouth is below instead of at the most projecting part of the head, and the fins have no rays. The remainder of the yolk is suspended from the belly in the form of a bladder, but it daily diminishes in size, till it is at length completely absorbed by the animal. The duration of these changes varies extremely in different fishes; some accomplish them in a few days, while in others, months are required.

In frogs and all the naked reptiles, the development is very similar to that of fishes; in the scaly reptiles (snakes, lizards, turtles), and in birds, there are peculiar membranes surrounding and protecting the embryo during its growth, termed the allantois and the amnios; and in mammals there are additional complications of structure, which it would be impossible to describe clearly without occupying more space than could be allotted to a subject of this nature. For further information on this subject, we may refer to the various writings of Agassiz, especially his *Lectures on Comparative Embryology*, and his *Comparative Physiology*, from which this article is mainly drawn, and to Carpenter's *Comparative Physiology*.

**DEVE'LOPMENT, IN PHOTO'GRAPHY,** the process which immediately follows exposure, and which renders the picture visible in all its details. It consists in the precipitation or deposition of *new material* on that portion of the sensitive surface which has been acted on by light; the same principle therefore prevails in all processes. This may be made clearer by reference to a few examples. In the Daguerreotype process (q. v.), an iodised silver plate, after exposure in the camera, is exposed to the vapour of mercury; the vapour adheres to those portions of the plate which have undergone a peculiar molecular change from the action of light, but not to those parts unacted on. The lights of the picture are therefore 'developed,' or 'brought out,' by the acquisition of *new material*, i. e., mercury. A collodion negative is similarly 'brought out' by the precipitation, by means of a de-oxidising agent, such as pyrogallic acid, or proto-sulphate of iron, on the *actinised* portion of the plate, of *new material*, composed of metallic silver and organic matter. A similar change takes place in the Chrysotype Process (q. v.), where the metallic salt with which the paper is impregnated is reduced to a state of proto-salt, which reacts through the decomposition of water, and causes the precipitation of *new material*, in the form of finely divided metallic gold on the parts where light has acted. Other processes might be cited, but these are deemed sufficient to illustrate the principle stated above.

**DEVELOPMENT THE'ORY.** See SPECIES.

**DE'VENTER,** a thriving town of Holland, in the province of Overyssel, situated on the Yssel, about 55 miles east-south-east of Amsterdam. Tower-flanked walls surround D., which is further defended by a broad, deep ditch. The streets are usually narrow, but the market-places are spacious. The principal buildings are the cathedral—a structure in the early Gothic style—the town-house, the court-house, and prison. From the ramparts, which are used as a promenade, there is a commanding prospect. The industry of D. consists in iron-founding, in the manufacture of carpets, stockings, &c. Its gingerbread (called *Deventer Koek*) is celebrated throughout Holland, and many thousand pounds are exported annually. Its butter-market is also very important. Pop. 15,000.

**DEVI'CE**—from the middle-age Lat. *divisa*, a drawing or design—is a motto expressed by means of a pictorial emblem. The motto proper originated in the emblem, a written inscription coming to be added to the pictorial design, with the view of rendering the meaning more explicit. Devices thus consist of two parts—a pictorial figure called the 'body,' and a motto in words called the 'soul' of the device. As early as the times of Æschylus, the 'Seven heroes before Thebes' all appear with devices on their shields; and the same is related by Xenophon of the Lacedæmonians and Sicyonians. In the middle ages, devices on coat-armour came into regular and formal use, and chivalry employed them in its courtly expressions of devotion to the fair sex. They were used both as charges on the shield and as crests. The only respect in which the device differs from other heraldic emblems is, that it has always some specific reference to the history, or circumstances, or position of the bearer. As an example: Louis XIII. of France had a falcon as a device, with these words: '*Aquila generosior ales*' ('A more generous bird than the eagle'), by which he meant to denote his own superiority to the Emperor, whose device was an eagle. Devices, moreover, were generally borne only by the individual who assumed them, and not by the other members of his family or his descendants, like the crest or cognizance. They were often contrived to typify a special enterprise, the general character of the wearer, or even to designate his name—as the *mulberry* trees in the embroidered trappings of the horse of Thomas Mowbray, Duke of Norfolk. On all festal occasions, they figured on triumphal arches, on banners and hangings. At a later period, it became customary to work devices into buildings; friezes and stained windows were often covered with them. This practice has recently much gone out, at least in its original form. See Radowitz's *Die Devisen und Motto des spätern Mittelalters* (Stutt. 1850).

**DE'VIL,** or **SA'TAN** (Gr. *diabolos*, 'false accuser;' Heb. *satan*, 'adversary'), designates in the Old and New Testament a mighty spirit of evil who has, during unknown ages, ruled over a kingdom of evil spirits, and is in constant and restlessly active opposition to God. This belief, however, was very gradually developed in the Jewish mind; and it is beyond all question, that it acquired clearness and prominence through extra-national influences. In England, the 'doctrine of Satan' has never received any critical treatment at the hands of scholars; but in Germany, the subject has been most learnedly investigated. The conclusions at which some of the profoundest biblical scholars of the continent have arrived, and even the principles on which they proceed, may be rejected by us, but a brief account of their method of historical analysis may be neither uninteresting nor uninstructive. The older Hebrews, it is said, who lived before the period of the Babylonish captivity—judging from the silence of Scripture—knew nothing, and certainly taught nothing, of evil spirits in the later sense; i. e., of beings separated from God, who were evil in the essence of their nature, and worked evil only. *Moral* evil was rather looked upon as properly the act of man; *physical* evil, or adversity, on the other hand, as punishment merited through sin, and inflicted by a just and holy God, who was thus necessarily conceived as the true source of all calamity. The angels who foretold God's purposes, and executed his will, however great might be the physical evil they occasioned, are never accused of *moral* evil. Even in the Mosaic account of the seduction of Eve, there is nothing to induce us to believe that the author regarded the serpent other than as 'the most subtle of all the beasts of the field,' or that he meant to conceal under so plain a statement an allusion to Satan. It is probable, however, that at some early period in their history, the popular faith of the Jews, partly divorcing itself from its grand religious conceptions of the 'one living and true God,' and lapsing—as has everywhere been the case with the popular faith—into petty superstitions, had become familiar with the idea of certain fearful unearthly beings haunting wildernesses, similar to the fauns and satyrs of Greece, who might form the connecting-link in the later development of an actual demonism. Traces of this are clearly visible in the Pentateuch. The Hebrew word *seirim*, occurring in Leviticus xvii. 7, which our translators have rendered 'devils,' means only 'hairy ones.' Now, the Egyptians worshipped the *he-goat*, and the Hebrews partook, as we know, of their idolatry. Therefore Moses in this verse, forbidding them to commit this sin in future, says: 'They shall *no more* offer their sacrifices to *seirim*;' i. e., to the Egyptian he-goats. The development of demonism was materially furthered during and after the Babylonish captivity by Medo-Persian influences. In those canonical books of the Old Testament which belong, in their present form, to the post-exilian period—i. e., the period subsequent to the exile—the Jewish conceptions of angels become more definite. They possess different ranks, names, and specific offices. They are the tutelary guardians and helpers of particular lands and peoples, but are everywhere in absolute dependence on God. And now we meet also, for the first time, with an angel called *Satan*, who, however, still figures as a minister of God, and along with the others appears in heaven before the throne of Jehovah, but with the function assigned to him of accuser and seducer. It is he who—1 Chron. xxi. 1 (*Chronicles*, it should be mentioned, is considered by most critics, both orthodox and heterodox, to be the composition of Ezra, and therefore *post-exilian*)—stirs up David to number the people; while in the older Hebrew version (2 Sam. xxiv. 1) the same act is attributed to an angry God, the conception of Satan not *then* having clearly, if at all, presented itself to the Hebrew mind. It is Satan also who throws suspicion on the piety of Job, and with the permission of Jehovah, causes a series of misfortunes to befall him; while in Zechariah iii. 1, he is represented as 'resisting' the angel of God, and as a false accuser of the high-priest Joshua. As yet, however, an evil nature is not *expressly* ascribed to him, but, what is much the same, it is assumed that he takes a pleasure in active evil. It is a purely arbitrary and untextual interpretation of Isaiah xiv. 12 ('How art thou fallen from heaven, O Lucifer, son of the morning!') that would force these words to refer to the fall of the D., or determine from them his name. In the Apocrypha, of which only a small part is Palestinian, the rest being either *Chaldaico-Persian* (as, for example, *Tobias* and *Baruch*) or *Ægypto-Alexandrian* (as, for example, *Wisdom*) in its origin, the older Hebrew doctrine of misfortune coming from the angel of Jehovah is, so to speak, dismembered, and demons or evil spirits, in the New-Testament sense of the term (*pneumata ponēra*), are for the first time mentioned (and in *Tobias* and *Baruch* frequently) as the authors of calamities. According to the representations of these writings, the evil spirits dwell, like the older Hebrew hobgoblins, in waste places, but associate themselves for the injury or destruction of men, enter into them as tormentors, and can be expelled only by magical or mysterious means. To this class of beings the heathen deities were reckoned to belong. But even here there is no mention of an *organisation* or kingdom or prince of demons. The first trace of a *Diabolos* or D. proper (and one in all probability springing from a foreign source) shews itself in the Book of *Wisdom* (ii. 24), in relation to the seduction of Eve, where it is said that through the D. the necessity of death has come into the world.

In the period elapsing between the close of the Apocrypha and the appearance of Jesus, the Jewish ideas of angels, as well as of demons and the D., received an extensive development. This angelology and demonology, wholly foreign to the older Hebrew religion, was derived in all its essential characteristics from the system of Zoroaster, with which the Jews had become familiar by their long and close intercourse with the Persian empire during the exile, and subsequently. It was, however, impossible to transfer the *dualism* of Zoroaster into a creed so purely *monotheistic* as that of the Jews; this would have destroyed the foundation on which their entire history rested. Two beings, equally eternal, equally powerful, was an idea which no Hebrew—mindful of the glorious deliverance of his forefathers out of the land of Egypt, of the law given amidst the thunders of Sinai, of the manna in the wilderness, of the triumphs in Canaan, and the golden psalms of David—could for one moment entertain. But, on the other hand, now that as a nation the Jews were become weak and of little account, hemmed in, and crushed by mighty and advancing empires, no conception could seem more true, or prove more consolatory, than that which permitted them to attribute their misfortunes to the agency of a demoniacal race, headed by a potentate only inferior to Jehovah himself. They could now believe that God had not forsaken his 'chosen people.' Thus, the dualism of Zoroaster suggested the kingdom and royalty of Satan, but the doctrine shaped itself in harmony with the national monotheism. The D. and his demons were represented as having been originally *angels*, who had fallen from their 'high estate,' been punished by God, and had therefore assumed a position of hostility, without, however, being able to materially frustrate the divine purposes. These opinions found an almost universal reception among the people, as well as among those Jewish theologians who, along with the Mosaic Law, held oral tradition to be an authentic source of religious doctrine. Indeed, the only Jewish sect which rejected them, was that of the Sadducees, who considered them, as also the doctrines of the Resurrection from the Dead, of the Messiah, of the Messianic kingdom, of the Last Judgment, of rewards and punishments, and of angels and demons, to be new, outlandish anti-Mosaic myths and theories. This conflict of opinion among the Jews prevented their ideas of the D. and demons from obtaining, in spite of their broad diffusion, a dogmatic and systematic stability. The populace and the Pharisees believed fervidly in the existence of such evil spirits; but their conceptions had not only all the heat, but all the confusedness of superstition.

In this condition were the Jews when the New Testament lifts up the veil of oblivion that had partially dropped on the face of the nation more than two centuries before, and the light of history again falls brightly on its features. We now find a swarm of demons in Palestine. These unclean spirits, however, can be exorcised. When expelled from the soul of the demoniac, their proper home is 'the abyss' (*Eis ten abusson*, Luke viii. 31). According to the popular conceptions, therefore, we must suppose their dwelling to be a dark subterranean region, although, like the demons of the Old Testament, they inhabit also the earth and the air. They were not, as the Greeks and Josephus thought, the evil spirits of dead men, but had angelic natures (see Matt. xxv. 41), and formed a society governed by a chief, called Satan, Devil, Beelzebub, Belial, &c. He is now firmly seated in the popular imagination as a fallen angel; but as yet there is no hint of his having seduced his followers from their allegiance to Jehovah, or of their having fallen at the same time. This idea first appears in the book of Revelation, chap. xii., where mention is made of a great war in heaven between Michael and his angels on the one hand, and the D. and his angels on the other. 'And the great dragon was cast out,' says the writer, 'that old serpent, called the Devil, and Satan, which deceiveth the whole world: he was cast out into the earth, and his angels were cast out with him.' Whether or not these popular conceptions of the D. and his influence were materially or spiritually interpreted by Christ himself, it is impossible to say. He may either have accommodated his language to suit the popular mode of realising the Power of Evil (a supposition which involves nothing unworthy of his sinless character), *or* (for this is the only other hypothesis compatible with a belief in his divinity) he may have intended to recognise the essential truth of that doctrine of an evil personality which the Jews derived from, or, at all events, developed under the inspiration of Zoroastrian ideas.

But whether Christ meant to accommodate his language to the popular conceptions or not, the primitive church assumed the personality of the D. as an unquestionable fact. The New Testament ideas on this point were not only greatly enlarged, but in many respects entirely changed, partly through the introduction of a considerable number of heathen notions, and partly through the dogmatic tendencies of the time, in consequence of which the various statements in the Bible regarding Satan and evil were *uncritically* and *unhistorically* heaped together, and a doctrine of Satanic agency elaborated *logically* but not *theologically.* Holding firmly to the belief of a Satanic kingdom of darkness opposed to Christ's kingdom of light, the majority of the early Christians ascribed all evil, physical as well as moral, to the D. and his demons; failures of the crop, sterility, pestilence, murrain among cattle, mental maladies, persecutions of the Christians, individual vices, heresies, astrology, philosophy, and especially the whole body of heathenism, with its mythology and religious worship. The heathen gods were believed to be conquered by the work of Christ, but not to be wholly powerless; they sank down into demons, and so a part of their mythology passed into the doctrine of the Devil. It was they who, as demons, meaning to deceive, uttered oracles, were present at sacrifices, and inhaled the sacrificial incense, whereby the notion gained ground that the demon-nature was ever growing more and more sensual and materialised —a notion that reacted again on the conception of hell, which soon began to be painted in coarse earthly colours, blazing with eternal fire, through which blackened devils and scorched souls flitted in endless torment. From the gross materialism that now vitiated all conceptions of the D. and of demons, sprang the loathsome belief, common enough in the early church fathers, but during the middle ages exhibiting itself only in the superstitions of the vulgar—viz., of the carnal intercourse of devils with women. See WITCHCRAFT.

Concerning the fall of the 'devil and his angels,' opinions were long diverse. Some supposed that it occurred through envy; others, through pride; and others, again, through concupiscence and excess; some placed it before, and others after the seduction of Eve by the serpent. Several of the Fathers (for example, Augustine) believed that man was created to fill up the gap which had been caused in the kingdom of Christ through the apostasy of Satan and those whom he had led astray. Meanwhile, the idea of the importance of the death of Jesus had been dogmatically elaborated. At first, Christians saw in that death a sacrifice, and in his blood a propitiatory power; but soon after, their thoughts reverted to the other scriptural representation of an actual victory over the D., a restoration of the Divine image in man, and the source and condition of holiness; whence was developed a very wonderful dogma concerning the devil. God having declared that whoever should transgress his law, should incur death and damnation; and man having done so, God's justice and veracity compelled him to keep his word. But inasmuch as Eve was beguiled into transgression, and fell as it were unwittingly, it did not seem for the honour or good of the Deity that rational beings, partakers also of his own spirit, should be lost through a trick of the Fiend; wherefore Jesus offered himself to the D. as a ransom for the souls of men. The D., thinking 'the *man* Christ Jesus' of more value than all the rest of the race put together, closed the bargain immediately. But deceived in his turn by the 'appearance of flesh,' he did not recognise the Deity concealed beneath it; and not being able to retain the latter (shrinking from it, in fact, horrified and dismayed), he lost *both*—Christ and man. The D. was, however, *actually* deprived only of Christians; in all other men he dwelt and ruled through the force of original sin. In consequence of this, he was formally 'banished' (until the 3d c.), not only from 'demoniacs,' but also from all converts from Judaism and heathenism to Christianity; and when the practice of baptism had shaped itself into the dogma, that it was 'a necessary preliminary to holiness,' exorcism, or 'driving out the devil,' became a Christian 'art,' exercised on all new-born children. Those who died unbaptized, were (by that ruthless logic that frequently marks a barbarous theology) sent to hell; for although *potentially* Christ's, the church had not yet rescued them from their satanic master, by the appointed rite, and so the conditions being unfulfilled, the D. carried off his prey. Yet the heart of humanity, stronger in its simple instincts than the most iron creed ever hammered out of the human brain, shewed its holy presence even in so fearful a dogma; and although it could not deliver the lost infants from the region of eternal fire, it assigned them less painful pangs, and a less dreadful dwelling-place. But while the power of the D. over all not guarded by Christian faith and rites, was supreme; over those who were so guarded, it was utterly weak. No Christian, not even the weakest, could be *forced* by him to do evil. Thus far had the 'doctrine of the devil' been developed at the 8th c., and at this point it has essentially remained in the Eastern or Greek Church; but in the Western, it took yet another development. This was mainly occasioned by the writings of Pope Gregory the Great, who partly took up the popular notions himself, infused into them other then prevalent theological opinions, and elevated the result of the incongruous mixture to the dignity of church doctrine. He calls the D. 'a stupid beast,' because he hopes for heaven, without being able to reach it, and entangles himself in his own net; but on the other hand, he admits him to have a *potentia sublimitatis*, and utters the profound idea that he cannot comprehend our thoughts. In these three notions lie the essential germs of the Germanic Faust-devil. The old German and Norse mythologies poured a flood of heathen fancies into the 'doctrine of the Devil.' Even Ulfilas, at a much earlier period, had translated the New Testament word *daimon* or *daimonion*, by *unhulthô*, i. e., she-devil, or sorceress, because the old Germans believed in *female* demons, while the Christian *usus loquendi* contains no trace of such. The peculiarly German conception of a now malignant, now gentle *female* devil, lives to this day in the German phrase, 'The devil is beating his mother' (when rain and sunshine quickly alternate). In England and Scotland, too, the phrase is, or recently was current, 'The devil and his dam.' The Germans have also the proverb, 'Where the devil cannot come, there he sends his grandmother.' Soon, however, the word *diabolus*, in violation of the New Testament distinction between it and *daimon*, came to signify devils of every or any sort. The Gothic form of the word was *diabulus, diabaúlus ;* old Saxon, *diubhul, diubhal, diobol ;* old High German, *diufal, tieval, tiubil*, &c. The dwelling of the D. was, of course, hell, which, however, according to old Germanic and Scandinavian notions, was placed in the dreary regions of the north. Although his mischievous powers are to be pretty well controlled till the coming of Antichrist, when he expects to hold carnival, yet, like the ancient gods and demons, he occasionally appears on the earth. He then assumes at times a purely human form, but, like Vulcan, who was thrown down from heaven like himself, and the smith Wieland, of German mythology, he is somewhat lame. He is covered with a gray, green, or red cloak, like the Kobolds (q. v.) and Dwarfs (q. v.), (the earth and house spirits of the suppressed heathenism) : sometimes, also, he appears black and sooty, as befits his dwelling-place, and his opposition to a pure God. But as the old deities, both classical and German, possessed the power of transformation to a most remarkable degree, the D., through his relationship with these, inherited this power when they vanished from the scene. The form he most frequently assumed was that of an animal, approximating, in this respect, to the German forest-spirits and the Greek satyrs and fauns. At one time, he shews the foot of a horse or goat, with horns and tail ; at another, he appears as a black horse, a he-goat, a hog, a wolf, a hell-hound, a raven, a serpent, a worm, a dragon, or a fly. The conception of the power of the D. was vastly enlarged by the influx of these new fancies. In fact, it rose almost to a new dualism ; but, on the other hand, also, many mild and friendly *traits* of the heathen gods passed over into the popular conception of the D., and gave to his nature a quite new, humorous, and even merry side. As, after the introduction of Christianity, offerings were still occasionally made to the old gods, the D. shared in these honours. A horse, a he-goat, or a hound was at times sacrificed to him ; and to the present day the expression has survived, 'To kindle a fire for the devil'—obviously an allusion to altar-flames. Various features of the old Norse gods, especially of Loki and Donar (Thor), the gods of fire and thunder, were also transferred to him. Hence the still current phrases in Germany, when thunder is heard : 'The devil must be striking,' and 'The runaway goose is gone to the devil.' (*Donner*, 'thunder,' is the word used for devil in this case.) Every power, too, which, according to the older heathen belief, was lodged in the lesser demons, giants, &c., had now its proper centre in the great Fiend himself, who could perform all the pranks attributed to the more grotesque creations of the Norse mythology, and work all the evil of the more malignant spirits ; but, in general, these beings were rather pressed into his service than absorbed by him, or incarnated in his person.

So did this great, originally Persico-Judaic belief spread itself through all Christian lands, incorporating with itself, first, the kindred conceptions of the ancient classical world, and, ultimately, the rich and varied superstitions of our Teutonic and Scandinavian forefathers. Thus decked out in the costume of many different climes and ages, the Image of Evil passed into the light of the modern world. Every step forward that it now took robbed it of some potent spell that used to chill the blood and strike the heart with awful horror. Men first lost faith in the D.'s occasional incarnation ; then medical science destroyed his claims to the origination of mental phenomena, which he was once supposed to have directly caused ; natural science deprived him of his control over the elements ; historical criticism plucked from him his borrowed feathers ; while metaphysics and a deeper religious exegesis have combined, not, perhaps, to annihilate his personality or deny his influence, but certainly to realise the former under a more spiritual form, and to limit the latter by a reverential belief in the wisdom and goodness of God. See Mayer's *Historia Diaboli* (2 vols. Tüb. 1780), Horst's *Dæmonomagie* (2 vols. Frankf. 1817) and *Zauberbibliothek* (6 vols. Mainz. 1821—1826), and Grimm's *Deutsche Mythologie* (Gött. 1835, 2d edit. 1844).

At the outset of this article, it was stated that the 'doctrine of the devil' had received no critical treatment from English scholars. The following appears to be the prevalent mode of regarding the subject in this country. The doctrine of the existence of a personal D., the chief of evil spirits, and directly or indirectly the author of at least all *moral* evil, is maintained by reference to the Bible, regarded as containing one revelation of truth harmonious in all its parts, and gradually developed. The Scriptures of the Old and New Testaments being thus regarded, and the supposition of conflict between the doctrines of their different books, or of error in any of them being rejected as inconsistent with a full recognition of their inspiration and divine authority, the doctrine in question is unavoidably deduced from them. It is assumed to appear in the narrative of the Fall in Genesis, and the name *serpent* is again applied to the D. in the book of Revelation, where he is described as 'that old serpent . . . . which deceiveth the whole world' (Rev. xii. 9) ; he is believed to be repeatedly mentioned in the Old Testament. The hypothesis of an extra-national origination and development of the idea of the D. would, of course, be repudiated, and orthodox divines would consider it more probable that the Persians borrowed from the Jews than that the Jews borrowed from the Persians. The mention of the D. in the New Testament is held to be conclusive, not only of his existence, but of the belief in that existence (even when not expressed or hinted at) among the older Jews. The warnings and exhortations addressed to Christians are, it is also said, framed on the supposition of dangers arising from his violence, power, and subtlety. It is further argued, that the principal objections urged against the doctrine of the existence of a D. are substantially the same which present themselves to the mind as difficulties when we speculate on that which, however, is so undeniable—the existence of moral evil.

**DEVIL'S DUST**, the name sarcastically given to old woollen materials manufactured into some variety of cloth. See SHODDY.

**DEVI'SE**, in English Law, the conveyance of land by will. As personal property or chattels is said to be bequeathed, so lands are said to be devised. It is said, *Co. Litt.* 111 b. n. 1, that, under the Saxon and Danish rule in England, the owners of land were entitled to convey their lands by will. It is certain that so soon as feudal customs were established in this country, the testamentary power over land ceased ; and from the Conquest to the reign of Edward IV., this species of property could be transferred by conveyance *inter vivos* only ; but during the reign of the latter monarch, a new mode of transfer began to be adopted, called a Conveyance to Uses (q. v.). By means of this species of conveyance, a party wishing to convey land otherwise than the common law allowed, actually conveyed the land to another person to such *uses* as he should appoint. The equity courts then regarded the party in whose favour the conveyance had been made as a mere trustee, and obliged him to relinquish the land in favour of any one whom the original owner might appoint. The power of appointment thus remaining in the owner might be exercised by will. By a statute of 27 Henry VIII., this mode of passing land by will was abolished; but, five years after, by 32 Henry VIII. c. 1, followed by 35 Henry VIII. c. 5, it was enacted, that all persons having estates in fee-simple should have power to devise the whole of their *Socage* (q. v.) lands, and two-thirds of their land holden by *Knight's Service* (q. v.). Finally, by 12 Charles II. c. 24, tenure by knight's service was abolished, and converted into socage; so that the power of devising land was extended to all lands except Copyholds (q. v.). But to the general rule that land could not pass by will, there had always existed an exception in favour of lands which, by the custom of the manor, had always been so conveyed; and this mode of devise by custom continued to exist even after the statute of wills of Henry VIII. For this practice there were two grounds: 1. That the power of devising lands was limited by statute to two-thirds of the land held by *knight's service*, whereas devise by custom might carry the whole land. 2. In order to an effectual devise of land under the statutes of Henry VIII., it was necessary that there should be a will in writing, while a verbal or nuncupative will would carry land by custom. By 29 Charles II. c. 3, the statute of Frauds (q. v.), this distinction was removed, and it was enacted that a will in writing, attested by three or four witnesses, should be necessary for conveyance of all lands. It must be observed that this power of devising lands was confined to lands belonging to the testator at the time of making his will, so that after-acquired lands would not pass by it; and also, that religious bodies and other corporations were, by the law of Mortmain (q. v.), restrained from being devisees of land. Thus stood the law at the period of the recent Wills Act, 7 Will. IV., and 1 Vict. c. 26. By this statute, devises of land are placed on the same footing as to execution as other wills, and will carry all landed estates belonging to the devisor at the time of his death. See WILLS, and generally on this subject, see Jarman on Wills.

In Scotland, where the rules of the feudal system in regard to the transference of land are still in great measure observed, it is incompetent to convey land by will. See DISPOSITION *mortis causâ;* and in foreign countries the power is subject to various rules differing from those in force in England. Hence, where a person resides in one country, and is possessed of landed property in another, questions of jurisdiction frequently arise as to the law which shall govern the power of disposal. In these cases, it is now a recognised principle that the *lex rei sitæ* is that which must prevail. See Story's *Conflict of Laws*, p. 719, *et seq.*

**DEVI'ZES** (anciently, Divisæ, Divisis, De Vies), a parliamentary and municipal borough, in the middle of Wiltshire, near the Avon and Kennet Canal, 22 miles north-north-west of Salisbury. It lies high at the mouth of Pewsey Vale, between the thinly peopled tracts of Salisbury Plain and the Marlborough Downs. Pop. (1861) 6639. D. returns two members to parliament. It has silk-throwing mills, and manufactures of snuff and malt, and is the seat of one of the most important corn-markets of the west of England. The Corn Exchange has standing-room for nearly 3000 persons. The chancel of St Mary's Church in D. is believed to be nearly as old as the Conquest. Roman household gods and coins have been found here. D. arose in a castle built by Roger, Bishop of Salisbury, in the time of Henry I. This castle, of which only the walls of one of the dungeons remain, was besieged and taken by Cromwell in 1645. From the time of Henry VIII. till about 1820, D. was the seat of extensive cloth manufactures.

**DEVOIRS OF CALAIS** were the customs due to the king for merchandise brought to, or carried out of, Calais while our staple (q. v.) was there.—*Cowel's Interpreter.* 'Merchants of the west may buy merchandises, so that they find sureties to carry them to the west or to Calais.'—2 Rich. II. st. 1. c. 3.

**DEVO'NIAN SY'STEM.** The name proposed by Murchison and Sedgwick to replace the more characteristic and older term Old Red Sandstone, because the slaty and calciferous strata in Devonshire contain a much more copious and rich fossil fauna than the red arenaceous rocks of Scotland, Wales, and Herefordshire, with which they were shewn to be contemporaneous. The older descriptive name, Old Red Sandstone, is still generally retained, and to it we refer for a description of the rocks of the system.

**DE'VONPORT** (before 1824, called PLYMOUTH DOCK), a parliamentary and municipal borough, maritime and fortified town, and naval arsenal, in the south-west of Devonshire, situated on Stonehouse Creek, on the east shore of the estuary of the Tamar (which is four miles long by half a mile broad, and called the Hamoaze), two miles west-north-west of Plymouth. It stands on high ground, with ramparts defended by batteries. The south-east and south walls are 12 feet high, with three gates, and externally a fosse cut 12 to 20 feet deep in the solid rock. The streets are regular, and the footpaths of marble. D. is supplied with water from Dartmoor by a circuitous route of 30 miles. It owes its importance to the dock-yard established here by William III., and still one of the chief naval arsenals in Britain. Locally, the yard is in Devonport, although official documents and popular phraseology frequently refer it to Plymouth. The yard comprises six building-slips, for various rates of vessels. There are also five docks—three for first-rates, and two for second. The number of hands employed is generally about 2500. Rope-making, sail-making, and anchor-forging are also carried on. D. has residences for the port-admiral and governor, barracks for 2000 men, a military hospital, telegraph establishment, victualling-office, and grand parade. D. has breweries, soap-works, and an extensive trade in refitting and victualling ships. Pop. (1861) 64,798, much connected with the dock-yard and shipping. D. returns two members to parliament.

**DE'VONSHIRE**, a maritime county, in the south-west peninsula of England, between the Bristol and English Channels. Greatest length, 71 miles; greatest breadth, 68; average, 46; area, 2590 square miles, ⅘ths being in pasture or arable. The north coast, 60 miles long, is mostly steep and rocky; the chief indentation being Bideford Bay, 18 miles broad and 8 deep. The south coast, 100 miles long, is also lined with cliffs, and has Tor Bay, 3 by 3½ miles, and Plymouth Sound, 3 by 3 miles. The general surface is hilly, and the table-lands of Dartmoor in the south of D., Exmoor in the north-east of Devon and north-west of Somerset, and Blackdown in the east of D. are high, heathy, and rocky. The lower hills are grassy. The loftiest eminence is Yes Tor, in Dartmoor Forest, 2050 feet. The chief rocks are granite in Dartmoor, and

Devonian, Carboniferous, and Permian strata, with some Silurian strata, magnesian limestone, greensand, chalk, and trap. Copper, tin, iron, and other metals occur, with potters' and pipe clays, Bovey coal, marble, gypsum, fluor-spar, and loadstone. The rivers are very numerous, the chief being the Exe, 54 miles long; Dart, 36; Tamar, 59; Torridge, 53; and Taw. These rivers have tidal estuaries, 5 to 11 miles long. There is an intermitting spring at Brixham. The climate is humid and equable—cool in summer, and mild in winter. The great mildness of the south coast in winter has made it much resorted to by invalids, especially those in consumption. Here myrtles flourish in the open air, and, with a little care, the orange and lemon. From its humidity, D. is more grassy than Cornwall, and there are fine meadows along the rivers. In the south, especially in Exeter Vale, the soil is very productive. The chief crops are grass and clovers, alternating with corn and potatoes. The fertile red loam of Exeter Vale produces wheat, barley, beans, pease, and flax. D. has much oak-wood and extensive orchards. It is famed for clotted cream and cider. The apple-trees grow on the hill-slopes and in the hedges. The chief manufactures are serges, linen, gloves, and lace; the chief exports are butter, cheese, cattle, and sheep. The red Devon breed of cattle is highly valued. Many ponies are fed on Dartmoor. D. has important pilchard, mackerel, dory, and salmon fisheries. The electric torpedo occurs in the estuaries. D. is divided into 33 hundreds, 470 parishes, and 17 poor-law unions. The chief towns are Exeter, the county town, Plymouth, Devonport, Tavistock, Tiverton, Barnstaple, Honiton, Totness, Ashburton, and Dartmouth. D. sends 22 members to parliament—4 for the county, and 18 for the above towns. In 1851, pop. 567,098 (in 1861, 584,531); 1614 schools, with 64,266 scholars; 1297 churches (549 Church of England, and 379 Methodist). D. has many British and Roman remains, as stone circles, cromlechs, barrows, and camps. The Saxons failed to conquer D. till the 9th century. It was ravaged by the Danes in the 9th and 10th centuries, and by the Irish in the 11th century. At the Reformation, 1549, there were great disturbances in D., on the change of the church-service. In 1688, the Prince of Orange landed at Tor Bay, in this county.

**DEW.** For any assigned temperature of the atmosphere, there is a certain quantity of aqueous vapour which it is capable of holding in suspension at a given pressure. Conversely, for any assigned quantity of aqueous vapour held in suspension in the atmosphere, there is a minimum temperature at which it can remain so suspended. This minimum temperature is called the dew-point. During the daytime, especially if there has been sunshine, a good deal of aqueous vapour is taken into suspension in the atmosphere. If the temperature in the evening now falls below the dew-point, which after a hot and calm day generally takes place about sunset, the vapour which can be no longer held in suspension is deposited on the surface of the earth, sometimes to be seen visibly falling in a fine mist. This is one form of the phenomenon of dew, but there is another. The surface of the earth, and all things on it, and especially the smooth surfaces of vegetable productions, are constantly parting with their heat by radiation. If the sky is covered with clouds, the radiation sent back from the clouds nearly supplies an equivalent for the heat thus parted with; but if the sky be clear, no equivalent is supplied, and the surface of the earth and things growing on it become colder than the atmosphere. If the night also be calm, the small portion of air contiguous to any of these surfaces will become cooled below the dew-point, and its moisture deposited on the surface in the form of dew. If this chilled temperature be below 32° F., the dew becomes frozen, and is called *hoar-frost.* The above two phenomena, though both expressed in our language by the word dew, which perhaps helps to give rise to a confusion of ideas on the subject, are not necessarily expressed by the same word. For instance, in French, the first phenomenon—the falling evening-dew—is expressed by the word *serein;* while the latter—the dew seen in the morning gathered in drops by the leaves of plants, or other cool surfaces—is expressed by the word *rosée.*

The merit of the discovery of the 'Theory of Dew' has been commonly ascribed to Dr Wm. Charles Wells, who published in 1814 his *Essay on Dew*, which obtained great popularity. The merit should, however, be divided between him and several others. M. Le Roi of Montpelier, M. Pictet of Geneva, and especially Professor Alex. Wilson of Glasgow, largely contributed by experiment and induction to its formation. Its history is very interesting, and the curious reader will be well repaid by a perusal of an article on the subject by Mr Tomlinson of King's College School, London, in the *Edinburgh New Philosophical Journal* (New Series), vol. xiii. No. 1. January 1861.

**DE'WBERRY** (*Rubus cæsius*), a plant of the same genus with the Bramble (q. v.), and very nearly allied to it, but having weaker and more prostrate roundish stems, which take root at the end, their prickles unequal and passing insensibly into hairs, the fruit consisting only of a few (1—5) grains, which, however, are much larger than those of the brambleberry. The name is derived from the dew-like, bluish bloom which covers the fruit. The D. is common in some parts of Britain, and in many parts of Europe and of Asia. The fruit is very sweet and agreeable, and makes an excellent wine. The D. of North America (*R. procumbens*), abundant in the forests of Canada, is a delicious fruit, much superior to the British fruit of the same name, and more tart. The plant is of very humble growth, scarcely rising above the ground.

Dewberry.

**DE WETTE**, Wilhelm Martin Leberecht, one of the ablest theologians of modern Germany, was born 14th January 1780, at Ulla, near Weimar, and studied at the university of Jena. In 1807, he was appointed extraordinary professor of philosophy at Heidelberg; in 1809, professor of theology; and in 1810, was called to Berlin. By his popularity as a teacher, as also by his writings, De W. soon acquired a great reputation. In 1819, on account of a letter which he wrote addressed to the mother of the assassin of Kotzebue, he was deprived of his chair. Not long after, however, he was appointed professor of theology in the university of Basel, where his prelections and sermons in a short time secured him universal esteem and applause. In 1829, the grand council of Basel made him a member of the Council of Education, and granted him the freedom of the city.

In 1849, he was elected rector of the university, but died the same year, on the 16th of June.

De W. was a man of comprehensive learning, and acute philosophic discernment. His antipathy to the shackles of dogmatic theology gave keenness and vigour to his criticism. Yet he formed no school, and followed no master, so that it is difficult to describe his position. He cannot be classed either with Paulus, Strauss, or Baur. A temperate but very decided historical rationalism, on a broad basis of moral reverence, would perhaps best express his biblical stand-point. His principal works are: *Beiträge zur Einleitung in das Alte Testament* (Contributions to an Introduction to the Old Testament), 2 vols. (Halle, 1806—1807); *Commentar über die Psalmen* (Commentary on the Psalms), Heidelberg, 1811; *Lehrbuch der historisch-kritischen Einleitung in die Bibel Alten und Neuen Testaments* (Historico-Critical Introduction to the Books of the Old and New Testament), 2 vols. (Berlin, 1817—1826); *Lehrbuch der Christlichen Dogmatic* (Compendium of Christian Dogmatics), 2 vols. (Berlin, 1813—1816); *Christlichen Sittenlehre* (Christian Ethics); *Vorlesungen über die Religion, ihr Wesen, und ihre Erscheinungs formen* (Lectures on Religion, its Essence, and Formal Manifestations), Berlin, 1827; *Das Wesen des Christlichen Glaubene* (The Essence of Christian Faith), Basel, 1846; and *Exegetisches Handbuch zum Neuen Testaments* (Exegetical Handbook of the New Testament). Besides these, De W. published a critical edition of the entire works of Luther.

**DE WITT**, JAN, a celebrated statesman of Holland, born at Dort in 1625, was the son of Jacob de Witt, a vehement opponent of William II., Prince of Orange. Jan inherited his father's hatred of the office of stadtholder, and the family that filled it. His education was carefully attended to, and he soon exhibited remarkable ability. He was one of the deputies sent by the States of Holland in 1652 to Zealand, for the purpose of dissuading that province from adopting an Orange policy. There his eloquence secured him universal confidence, which, however, in such troublous times could not long be retained. In the same year he was made grand pensionary. The Orange party (supported by the populace and the clergy), during the war carried on between England and Holland, was ever striving to increase the power of the young prince (afterwards William III.), who was then a mere infant; the republican, or oligarchic party, composed of the nobles and the wealthier burgesses, at the head of which was De W., sought, on the other hand, to strip the House of Orange of all power, and to abolish entirely the office of stadtholder. During William's minority, the advantage was, of course, with De W. and the republicans. In 1654, on the conclusion of the war with England, a secret article was inserted in the treaty drawn up between De W. and Cromwell, in virtue of which the House of Orange was to be deprived of all state-offices. After the restoration of Charles II., De W. leaned more to the side of France. This tendency necessarily received an impetus from the renewal of hostilities between England and Holland in 1665. These lasted for two years; and although De W. acted with great vigour, his influence was diminished, and his party was compelled to concede a larger measure of power to the House of Orange. De W.'s prospects became still more clouded when the designs of Louis XIV. upon the Spanish Netherlands became manifest. The Orange party carried their point in the elevation of William to the family dignity of stadtholder. On the invasion of the Netherlands by Louis XIV. in 1672, the Prince of Orange was appointed commander of the Dutch forces; and the first campaign proving unfortunate, the popular clamour against De W. greatly increased, who had previously resigned his office of grand pensionary. His brother, Cornelius, accused of conspiring against the life of the stadtholder, was imprisoned, and tortured. De W. went to see him on his release. When they were coming out of prison, they were attacked by an infuriated crowd, and were both murdered, August 20, 1672. The states-general demanded an investigation, and the punishment of the murderers, but the stadtholder did not take the necessary steps. De W. was personally a man of upright character. His *Memoirs* (which were published during his lifetime) contain much important information regarding the politics of the time.

**DE'WSBURY**, a manufacturing town in the West Riding of Yorkshire, situated at the base of a hill, on the left bank of the Calder, is 32 miles south-west of York, and 8 miles south-south-west of Leeds. It is governed by a local board of health, possesses a chamber of commerce, and is the centre of the Dewsbury union. Pop. (1861) 18,148. D. is noted for its manufactures of low woollen goods—as pilots, sealskins, unions, &c.; and carpets and blankets. There are collieries and ironworks in the immediate neighbourhood. Railways—London and North Western, and Lancashire and Yorkshire. Calder navigation connects the town with Hull and Liverpool. Here Paulinus, first Archbishop of York, lived in 627. Saxon and Roman relics have been found here.

One mile north of D. is situated BATLEY, the principal manufacturing town in the kingdom for low woollen and army cloths. It is governed by a local board of health, and possesses a chamber of commerce. It is on the Manchester and Leeds line of the London and North-Western Railway. Pop. (1861) 14,173.

**DE'XTRINE** (syn. British gum, torrefied starch). When starch is carefully heated to 400° F., or until vapours arise from it, it becomes soluble in cold and hot water, and loses its gelatinous character; it also has the property, when viewed by polarised light, of turning the plane of polarisation to the right; hence its name. It is often used as a substitute for gum-arabic in the processes of calico-printing, and for stiffening different goods; it is also applied to the back of postage-stamps. Its value as a substitute for gum consists in its being more flexible and less brittle when dry than that substance. Starch may be converted into dextrine by the long continued action of dilute acids at a high temperature; also by the action of Diastase (q. v.). Dextrine and starch are isomeric, both being composed of $C_{24}H_{20}O_{20}$; but dextrine may be distinguished from the latter body by its pale buff colour, its insolubility in alcohol, and its not being rendered blue by iodine, which gives with it a dingy purple tint.

**DEY**, a word of doubtful origin, but appropriated by the ruler of Tripoli, and also of Algiers until its conquest by the French. At one period, Tunis likewise was governed by a Dey, but this title has long been supplanted by that of Bey. See BEG.

**DHALA'C**, an island in the Red Sea, off the coast of Abyssinia, in lat. 15° 46′ N., long. 40° 6′ E. It is 30 miles long, 15 miles in average breadth, and 120 miles in circumference. It is composed of coral rock, and its surface in general is flat and sandy. Doobelloo, a village on the east side, trades with Loheia and Ghizan, ports on the Arabian coast, exchanging fish, sharks' fins, turtle, and pearls, for millet and dates. The groups of islands in the vicinity of D. are called the Dhalac

Archipelago. The inhabitants are good sailors and skilful fishermen.

**DHAMEE′**, a hill-state of India, of about 25 square miles, on the left bank of the Sutlej, in about lat. 31° 12′ N., and long. 77° 8′ E. It is merely a collection of mountains and valleys. The general elevation probably exceeds 4000 feet, and even the margin of the river is 2283 feet above the level of the sea. D. contains 3000 inhabitants, and yields a revenue of £350 a year, of which about a fifth is paid as tribute to the British government.

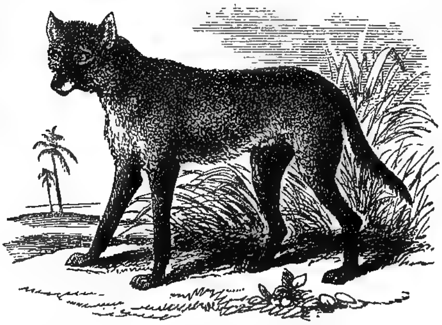
**DHAR**, a town situated on the table-land of Malwa, in Central India, stands in lat. 22° 35′ N., and long. 75° 20′ E., at an elevation of 1908 feet above the sea. It is said to have at one time consisted of 20,000 houses, implying a population of about 100,000, and though very greatly decayed, it yet retains many traces of bygone magnificence—two large mosques of red stone, ten water-tanks of various sizes, and a fort defended by many considerable towers. It is the capital of a protected state of the same name, having an area of 1070 square miles, with 104,860 inhabitants.

**DHA′RWAR**, a town in the presidency of Bombay, close to the frontier of the presidency of Madras, stands in lat. 15° 28′ N., and long. 75° 4′ E. It has an English school, with about forty pupils, and two vernacular schools. The population has not been ascertained.

**DHARWAR**, the district of which the town above mentioned is the capital, extends in N. lat. from 14° 16′ to 15° 50′, and in E. long. from 74° 50′ to 76°, containing 3837 square miles, and 754,385 inhabitants. Its drainage is divided between the Arabian Sea and the Bay of Bengal, passing to the latter by the Tumbudra, a feeder of the Kistnah or Krishna, and to the former by the Kali Nadi, through a deep valley of the Western Ghauts. The most interesting feature of the country is its suitableness for the growth of American cotton. In 1842, after several previous failures, the New Orleans staple was cultivated with success to the extent of 25 acres; and within five years, the breadth of land thus sown had increased a thousandfold. In connection with this enterprise, a good road has been constructed to Coompta, on the Arabian Sea, where the cotton is shipped for Bombay. The prevalent language is Canarese, and there are fourteen vernacular schools, with about 1000 pupils.

**DHOB.** See CYNODON.

**DHOLE** (*Canis scylax*), an Indian species of dog, existing in a wild state in the Western Ghauts and some other mountainous districts. It is in size between a wolf and a jackal, with rather long legs, sharp muzzle, wide and pointed ears, straight and not bushy tail, light-bay colour, fierce keen eyes, and great courage. The name D. is extended to some other very similar species or varieties, natives of Ceylon, Nepaul, and other parts of the East, to which the common name *Red Dogs* has been sometimes applied, and for which Colonel Hamilton Smith has proposed the sub-generic name *Chryseus.* They seem not incapable of domestication, but whether any of the domesticated dogs are derived from them is wholly uncertain. There is no reason to think that any of them are the wild offspring of once domestic races. They all want the second tubercular tooth in the lower jaw, have oblique eyes, and the soles of the feet hairy. They hunt in packs. They are all inhabitants of the deepest recesses of wild mountain-forests. A remarkable characteristic of the dholes is their hostility to the feline races, the weaker and the young of which they attack and destroy. To this is ascribed the alarm which the tiger exhibits at the sight even of a domestic dog; and 'we may surmise,' says Colonel H. Smith, 'that the species of *Chryseus* are the instruments nature has appointed to keep down the superabundant increase of the great *felinæ* of the wilderness.'



The True Dhole (*Chryseus scylax*).

**DHOLPO′RE**, a town of Hindustan, on the left or north-west bank of the Chumbul, is in lat. 26° 41′ N., and long. 77° 58′ E., being 34 miles to the south of Agra, and 37 to the north of Gwalior. Here are some elaborately wrought mosques and mausoleums of freestone. Of the former, one is said to have been built by Shah Jehan, the founder of the modern Delhi, in 1634; and of the other edifices, some are of still earlier date. D. is the capital of a protected state stretching along the left bank of the Chumbul. containing 1626 square miles, and about 550,000 inhabitants.

**DHOORCATEE′**, a protected state in Hindustan, of not more than five square miles, is in lat. 31° 8′ N., and long. 77° 40′ E., lying in the basin of the Jumna towards that of the Sutlej. Small as it is, it is worthy of notice as containing the peak of Toongroo, which, at an elevation of 10,102 feet above the sea, forms one of the stations of the large series of triangles in the trigonometrical survey of the Himalaya.

**DHUBBOREE′**, a decayed town in Guzerat, belonging to the Guicowar, in lat. 22° 8′ N., and long. 73° 25′ E., lies 78 miles to the north-east of Surat, and 225 to the north of Bombay. It presents many memorials of ancient grandeur—such as a rampart of two miles in circuit, backed inwardly by a handsome colonnade; a magnificent tank, bordered by a grand flight of stairs and numerous Brahmanical temples—the whole richly adorned with curious sculptures. But a still more remarkable circumstance is, that, in a purely alluvial neighbourhood, where even a pebble is unknown, all these structures are of hewn stone. The population, which is inconsiderable in number, shares the place with swarms of monkeys.

**DHUMTOU′R**, or **DUMTAU′R**, a valley of the Punjab, stretches in N. lat. from 34° to 34° 10′, and in E. long. from 72° 55′ to 73° 15′. Here a traveller from the north first finds the peculiar vegetation of Hindustan. While behind him are luxuriant forests of oak, plane, walnut, and pine, the sugar-cane grows before him in such abundance as to form a principal article of fodder for cattle. The population is distributed into villages, each defended by a small fort against neighbouring marauders. The chief town, of the same name, is 16 miles to the east of the Indus, on the route between Attock and Cashmere.

**DHUNCHEE**, or **DHANCHI** (*Sesbania aculeata*), a plant of the natural order *Leguminosæ*, sub-order *Papilionaceæ*, of a genus having an elongated many-seeded pod, alternately swollen and contracted, as if it contained a string of beads. The D. is an annual herbaceous plant, much cultivated in Bengal upon account of its fibre; it has an erect, sparingly branched stem, 6—10 feet high. It is a plant of rapid growth, and succeeds best in low and wet soils. Its fibre is coarser than hemp, unless when it is cut at a very early period of its growth, is durable in water, but contracts considerably when wetted. It is steeped and prepared very much like Sunn (q. v.).

**DHWALAGI'RI**, once supposed to be the highest peak of the Himalaya, but now ascertained to be at most only the third in point of altitude, is stated at 26,826 feet above the sea. Its lat. and long. are 28° 42′ N., and 82° 32′ E. The mountain is within the limits of Nepaul.

**DIABE'TES** (Gr. literally a syphon, from *diabainō*, I go or flow through), a disorder of the general system, of which the principal symptom is a very much increased flow of urine. Diabetes is of two distinct kinds: the one, *diabetes insipidus*, is a mere exaggeration of the water-excreting function of the kidneys, accompanied by extreme thirst, and hence called *polydipsia* (Gr. excess of thirst) by some authorities; the other is a more complex disorder of the assimilation, consequent on the formation first, and the excretion by the kidneys afterwards, of an enormous excess of animal sugar (see Grape-sugar), the sugar being found in excess, not only in the renal excretion, but in the blood, and in nearly all the secretions which have been examined. The pathology of this disease, called *diabetes mellitus* (Lat. *mel*, honey), is very obscure, notwithstanding the numerous recent physiological researches which tend to throw light on the development of sugar in the animal organism, and which must undoubtedly be regarded as bearing on the solution of the problems connected with this disease. Unhappily, the cure of it is still entirely unknown, except in so far as it may be controlled or retarded by good management of the diet, drink, and clothing. All diabetics are subject to progressive emaciation, and they often become subject to true tubercular consumption (q. v.), or other chronic disease of the lungs; it is chiefly in warding off this termination that the medical art can be of service, as well as in relieving the symptoms as they occur. The first fact observed in cases of diabetes is usually the increased flow of urine, when it becomes so great as to amount to a practical inconvenience; and also a considerable increase of the appetite, and an unquenchable thirst, which rarely fail to accompany the disease from the beginning, but often do not attract attention, or at least suggest the idea of anything wrong, till an advanced stage of the disorder. When the patient demands medical assistance, he is usually somewhat thin; the pulse is quiet, the skin cool, the heat of the surface, indeed, habitually rather low and easily depressed. There is often a complete absence of perspiration, which gives a peculiar feeling of harshness to the surface, especially of the palms of the hands. With these symptoms, the first approaches of pulmonary disease may concur. In the very last stages, there is sometimes dropsy of the feet; and the urine may be natural in quantity, or even diminished. For the other characters of diabetic urine, see Urine. The cure consists in removing from the diet, as far as possible, consistently with comfort and due nourishment, everything which easily turns to the formation of animal sugar in the system, especially all excess of farinaceous food. The complete suppression of sugar-forming food, however, as recommended long ago by Rollo, has not been found possible in practice in the majority of cases. Bread composed of gluten of wheat without starch, or bran-cakes baked with eggs, have been strongly recommended; and in most of the great capitals, as London and Paris, bakers may be found who regularly furnish bread suitable for this unfortunate class of sufferers; indeed, any intelligent baker who will take the trouble, may, under medical direction, be got to manufacture such bread when required; or it may be ordered in the form of cakes and biscuits, in quantities at a time, from London houses. Dr Camplin, himself a diabetic patient, has minutely studied the diet and regimen required, and published a little book, which we have no hesitation in recommending to all concerned, *On Diabetes, and its Successful Treatment*, in which full directions will be found for the manufacture of palatable and useful diabetic bread. The 'success' alluded to, however, is simply keeping the disease at bay by constant watchfulness. Medicines proper should be used only under the advice of the physician. There is no specific, and the unguarded use of strong remedies is to be condemned. Flannel should be worn next the skin, and the languid function of the cutaneous perspiration aided by the warm bath. The Turkish bath might possibly prove useful in this disorder, and could hardly do harm if carefully employed; but we have not heard, as yet, of any actual experiments in this direction for the cure of diabetes.

**DIABE'TIC SU'GAR** is a variety of sugar found in the blood and secretions of the higher animals, especially when afflicted with the disease called diabetes. It is a variety of grape-sugar or glucose. See Grape-sugar.

**DIABLERETS**, a remarkable mountain of the Bernese Alps, Switzerland, situated between the cantons of Bern and Valais, in lat. about 46° 18′ N., and long. 7° 15′ E., with an elevation of 10,670 feet above the sea. The D. is composed of limestone strata, the lower beds of which are so soft and shaly, that they are easily disintegrated by the infiltration of water given off from the glaciers on the north-east. The consequence is that, the foundation being worn away, the peaks tumble over into the valley, occasioning the most terrible catastrophes. Three peaks have already fallen in this way, and the two that yet remain threaten to follow sooner or later. In the fall in 1714, 15 people, 100 head of cattle, and 55 châlets were destroyed; and the result would have been much more appalling, had not premonitory noises given the inhabitants timely warning to escape. In 1749, the fall of another peak arrested the course of the Liserne, which thereafter formed two small lakes known as Derborenze.

**DIACAU'STIC.** See Caustic.

**DIA'CHYLON** (Gr. literally, from juices—i. e., vegetable juices, a deceptive etymology, as the plaster has really no such composition), the common healing or adhesive plaster, made by combining litharge, or the red oxide of lead, with olive-oil, so as to form a kind of soap. The preparation of this plaster is now entirely taken out of the hands of druggists, it being prepared on the great scale by machinery.

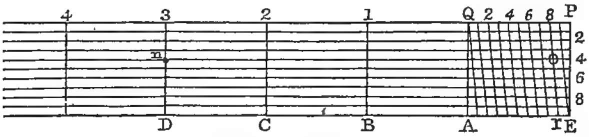
**DI'ADEM** was the name given to the fillet of silk, woollen, or linen which served as the distinguishing ornament of kings. It was generally narrow, being only a little broader on the forehead. The diadem of the Egyptian goddesses and kings bore the symbol of the sacred serpent. The diadem of Bacchus, as it appears in antique sculptures, was a plaited band going round the forehead and temples, and tied behind, with the ends hanging down. Among the Persians, the diadem was bound round the tiara or turban, and was of a blue colour worked with white. The early Roman emperors refrained from using this ornament, in order not to call up recollections of the hated kingly office. Diocletian was the first to introduce it again, and Constantine the Great added new ornaments to it. After his time, it was adorned with a single or double row of pearls and precious stones. Queens are also seen on coins ornamented with the diadem, with the addition of a veil. It was finally superseded by the Crown (q. v.).

**DIÆ'RESIS** (Gr. *diairo*, I divide), a term used in Grammar to signify the resolution of a diphthong, or of a contracted syllable, into two syllables; as Lat. *auræ* into *auraï*. The name is also given to the mark ¨ placed above a vowel letter, to indicate that it is to be independently pronounced, and not in conjunction with a preceding vowel; as in the above example, or in the word *aërial*.

**DIAGNO'SIS** (Gr. *dia*, through, and *gnosis*, knowledge), the through-knowledge or thorough knowledge of a disease, embracing its points of distinction from other diseases, its symptoms, their relation to one another, and to the state of the different organs and functions of the body, in so far as this can be appreciated during life. Diagnosis is usually spoken of in contrast with Prognosis, which implies the judgment framed by the physician as to the issues of disease; and also with Prophylaxis (*pro*, from, and *phylaxis*, protection), which refers to the warding off disease, when supposed to be impending. Diagnosis includes the study of all the vital phenomena of diseases, and also of their appearances after death, in so far as this can aid their discovery during the life of the patient. It is usual to speak of rational or physiological diagnosis, or diagnosis by symptoms—i. e., functional changes; and of physical diagnosis, or diagnosis by signs—i. e., objective phenomena appreciable by the senses of the observer. The latter method of diagnosis has been much enlarged in scope, and increased in importance of late years by the modern discoveries in Auscultation (q. v.) and Percussion (q. v.), and also by the great advances made in physiological chemistry, and by the use of the microscope.

**DIA'GONAL**, in Plane Geometry, is a straight line joining any two angles, not adjacent, of a rectilineal figure. A line drawn between two adjacent angles would coincide with the boundary-line. A triangle has no diagonal, because any two of its angles are adjacent; a four-sided figure has two diagonals; a five-sided, five; a six-sided, nine; &c. The number of possible diagonals in any figure is found by taking three from the number of sides, multiplying the remainder by the number of sides, and taking half the product. Thus, in the six-sided figure, the process is $\frac{3 \times 6}{2} = 9$. If the diagonals must be so drawn as not to intersect, their number is always three less than the number of sides. It makes no difference whether they all proceed from one angle or not. A diagonal in a solid bounded by planes, is a line joining any two solid angles so situated that the line does not coincide with any line on the surface. To find the number of such diagonals in a given solid: Multiply the number of solid angles by the same number diminished by one, and from half this product subtract the number of edges on the figure, and also the sum of the number of diagonals in all the faces. Thus, the cube gives $\frac{8 \times 7}{2} - 12 - 6 \times 2 = 4$ diagonals.

**DIAGONAL SCALE**, a system of lines by means of which hundredths of units may be laid down or measured with compasses. It is thus constructed: Lay off, on a straight line, any equal parts EA, AB, BC, CD, &c. Draw ten lines parallel to DE, and equidistant; and draw EP, AQ, B1, C2,... &c., perpendicular to DE. Divide QP, AE, into 10 equal parts. Join the 1st, 2d, 3d,...divisions on QP with the 2d, 3d, 4th,...divisions on AE respectively. If the divisions on AD each represent 100, each of those on QP will represent 10. Thus, from 3 on AD to 8 on QP is 380; but by moving the points of the compasses down to the fourth line, and extending them from *n* to *o*, the number will be 384. For the distance of 8 on QP from Q is 80, and of *r* from A is 90; and hence that of *o* from the line AQ is 84. When the divisions on AD denote tens, those on QP denote units, and from *n* to *o* would then represent 38 $\frac{4}{10}$ or 38·4. When the numbers representing the lengths of the sides of any figure would give lines of an inconvenient size taken from the scale, the numbers may be all multiplied or all divided by such a number as will adapt the lengths of the lines to the required dimensions of the figure.



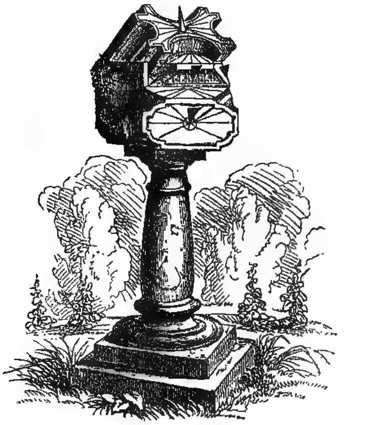
Diagonal Scale.

**DIA'GORAS**, a Greek poet and philosopher, was born in Melos, an island of the Cyclades. He flourished in the 5th c. B.C., but beyond his reputation for atheism, nothing very positive is known regarding his career. He is said to have been a disciple of Democritus of Abdera, and to have resided during the more important part of his life in Athens. He is alluded to by Aristophanes in the *Clouds* (424 B.C.); and from an epithet applied there to Socrates, it is highly probable that that great philosopher had been a pupil of D., or at least held similar opinions. This will perhaps explain to us the accusation brought against him of atheism. In all likelihood, D. was no atheist, but simply a *disbeliever in polytheism*; and the anecdotes related of him, such as his once throwing, when ill-off for fuel, a wooden image of Hercules into the fire, to cook his dinner, serve to confirm such a supposition. He seems to have been witty and fearless, and probably treated the rude superstitions of the common-place Athenians with dashing contempt. In this way he may have become specially notorious, and so fixed himself in the Greek mind as the *representative* atheist. D. was banished from Athens professedly on account of his impiety, but really on account of his politics. He went first to Pallene, and afterwards to Corinth, where he died. He wrote lyrics of various kinds, and a philosophical work entitled *Phrygioi Logoi*. Personally, he was a man of untainted character, and discharged his duties as a citizen in an earnest and exemplary manner.

**DI'AL AND DIALLING.** A *sun-dial* is an instrument for measuring time by means of the motion of the sun's shadow cast by a stile erected on its surface. It is an instrument of very great antiquity, the earliest mention of it being in Isaiah xxxviii. 8;

and before clocks and watches became common, it was in general use as a time-keeper. The art of constructing dials to suit any place and situation, was then an important branch of mathematical study; now the subject is more an object of curiosity than utility.

A dial consists of two parts—the *stile* or gnomon, usually the edge of a plate of metal, always made parallel to the earth's axis, and pointing towards the north pole; and the *dial-plane*, which may be of any hard substance, and on which are marked the directions of the shadow for the several hours of the day, their halves, quarters, &c. Dials receive various names, according, mostly, to the positions which they are constructed to occupy. When the dial-plane is on the plane of the horizon, the dial is called a horizontal dial; when perpendicular to that plane, a vertical dial. An equinoctial dial is one whose plane is parallel to the equinoctial plane. Besides these names, there are others, such as the south dial, north dial, east dial, west dial, polar dial, declining dial, of which it is useless to write at length. These names all depend on the position of the dial-plane. The cylindrical dial is a dial drawn on the curved surface of a cylinder. The ring dial is an ingenious small portable dial, but rather a curious toy than a philosophical instrument.



Old Sun-dial:
In the Zoological Gardens, Edinburgh.

A *night* or *nocturnal dial* is an instrument for shewing the hour of the night by the shadow of the moon or stars. Moon-dials may be constructed relative to the moon's motion; or the hour may be found by the moon's shadow on a sun-dial by the following rule: Observe the hour pointed out by the moon's shadow; find the days of the moon's age in the calendar, and take three-fourths of that number for the hours to be added to the time shewn by the shadow to give the hour of the night.

*Dialling.*—The *stile* of a dial being parallel to the earth's axis, those familiar with spherical trigonometry will readily see that the problem of constructing a dial resolves itself into that of ascertaining where the hour-lines cut a given circle, with a view to the graduation of the dial-plane. We do not here presume the reader to be acquainted with spherical trigonometry, and accordingly proceed to illustrate the principles of dialling in a popular manner, taking our illustrations from Ferguson's *Lectures* (4th ed., 1772, Lecture 10), which should be referred to for fuller information. Suppose P*ep* (fig. 1), a hollow and transparent sphere, as of glass, to represent the earth; and suppose its equator divided into 24 equal parts by the meridians *a*, *b*, *c*, *d*, &c., one of them passing through a given place, say London (see HORIZON), at the point *a*. If the hour of twelve be marked at the equator, both on the latter meridian and that opposite it, and all the rest of the hours in order on the other meridians, those meridians will be the hour-circles of London, because, as the sun appears to move round the earth in 24 hours, he will pass from one meridian to another in one hour. Then, if the sphere has an opaque axis, as P*ep*, terminating in the poles P and *p*, the shadow of this axis would fall, in the course of the day, on every particular meridian and hour, as the sun came to the plane of the opposite meridian, and would thus shew the time at London, and at all other places on the same meridian as London. If the sphere were cut through the middle by a plane ABCD, in the rational horizon of London, and if straight lines were drawn from the centre, *e*, of the plane to the points where its circumference is cut by the hour-circles of the sphere, those lines would be the hour-lines of a horizontal dial for London; for the shadow of the axis would fall upon each particular hour-line of the dial, when it fell upon the like hour-circle of the sphere. Similarly, if we suppose the sphere cut by *any* other plane facing the meridian, the hour-circles of the sphere will cut the edge of the plane in those points to which the hour-lines must be drawn straight from the centre; and the axis of the sphere will cast a shadow on these lines at the respective hours. The like will hold of any plane, whether it face the meridian or not, provided it do not coincide with it, or do not coincide with a plane through the poles, and perpendicular to the plane of the equator. In the latter case, the axis would have no elevation above the plane of the dial; in the former, the shadow would not move circularly.

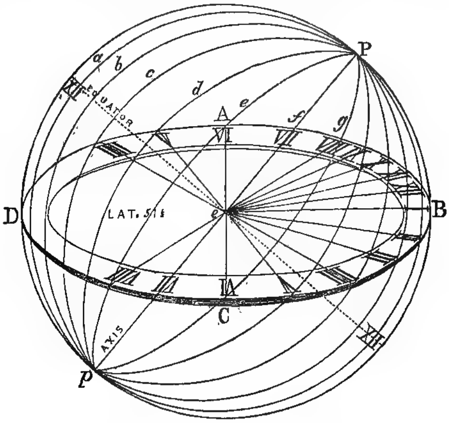


Fig. 1.

The *universal dialling cylinder*, an invention of Ferguson's, is represented in fig. 2. ABCD is a glass cylindrical tube, closed at both ends with brass plates, on the centres of which a wire or axis, EFG, is fixed. The tube is either fixed to a horizontal board, H, at an angle equal to the latitude of the place, or moves on a joint, so that it may be elevated till its axis is parallel to the earth's at any latitude. The 24 hour-lines are drawn on the outside of the glass, equidistant from one another, and parallel to the axis. The XII next B stands for midnight;

the XII next the board, for noon. When the axis is adjusted for the latitude, and the board levelled, with the line HN on the meridian, and the end towards the north, the axis EFG, when the sun shines, will serve as stile, and cast a shadow on the hour of the day among the parallel hour-lines. As the plate AD is parallel to the equator, and EFG perpendicular to it, right lines drawn from the centre to the extremities of the parallels will be the hour-lines of an equinoctial dial, and the axis will be the stile. A horizontal plate, *ge*, if put into the tube, with lines drawn from the centre to the several parallels cutting its edge, will be a horizontal dial for the given latitude; and similarly a vertical plate fronting the meridian, and touching the tube with its edge, with lines drawn from its centre to the parallels, will be a vertical south dial, the axis of the instrument in both cases serving for the stile; and similarly for any other plate placed in the cylinder. If, instead of being of glass, the cylinder were of wood, any of these dials might be obtained from it by simply cutting it in the planes of the plates, and drawing the lines on the surface of the section.

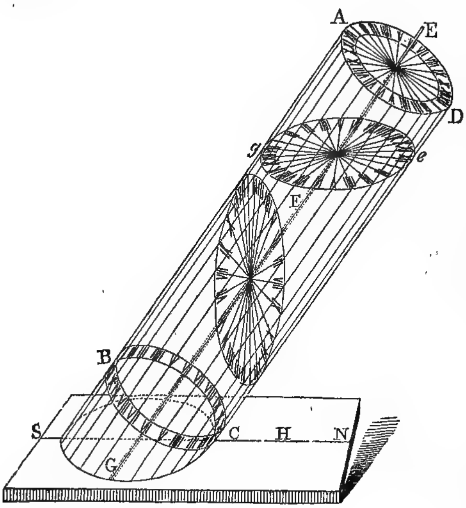


Fig. 2.

**DI'ALECT.** In speaking of a people having essentially all one language, but living extended over an extensive territory, the name of Dialects is given to those varieties or peculiar forms which that language assumes among the various tribes or other local divisions of the people. It is clear that the wider the separation comes to be between the several tribes, and the more they differ in mode of life and other circumstances, the more marked will the differences of dialect become. Also when a particular tribe of this people increases in numbers, and also extends its territory, the same process is repeated, and its dialect becomes broken into a number of sub-dialects. The principal check to this tendency to seemingly endless subdivision of language, is furnished by an increasing degree of common culture and civilisation. Where this is wanting, as in Africa and among the native populations of America, the subdivision is practically endless.

Another element is introduced into the problem by the fact, that the civilisation of some tribes develops itself more richly and ripens earlier than that of others, while some even undergo decline; this must occasion corresponding differences of dialect. Further, one dialect may become dominant over one or more of the others, through various influences, the chief of which is the power of poetry, especially if favoured by external relations. Finally, if to superior manifestations of oratory and poetry in any dialect, the conservative aid of writing be added, there is created a written language, which passes current among other tribes to the same extent that the literature of which it is the vehicle finds favour. It is not always the dialect most perfect in itself, nor yet that of the most powerful tribe or division of a people, that comes to be the written language. Accidental circumstances have, in many cases, decided the rivalry. The Bible happened to be translated by a High German, Luther, into his native dialect; other works on the then all-engrossing subject of religion followed in the same dialect; happily, too, the art of printing had just attained the perfection necessary to give these productions general circulation. It was this concurrence of circumstances that decided that High German should in future be the spiritual bond among the wide-spread German people. For there were other dialects whose claims to the distinction were at that time equal, if not higher. See also ENGLISH LANGUAGE.

When a dialect has thus become the vehicle of written communication, and of the higher kinds of oral address, its character and position become changed; and it stands henceforth in a sort of antagonism to the other dialects, and even to that out of which itself sprung. For written language is chiefly employed in the higher departments of human thought and activity. The intellectual and moral elements, therefore, predominate in it over the sensible; and what it gains in dignity, precision, and pliancy, it loses in richness of inflection, in friendly familiarity and naturalness. In conflict with this standard speech, the dialects must go to the wall. They live for a considerable time, it is true, even in the mouth of the educated classes, becoming, however, gradually more and more confined to the most necessary and familiar forms of intercourse, and losing their characteristics in the stream of the written language. They thus become, after a time, the exclusive possession of the lower orders, in which position they preserve many relics of old grammatical forms long after these have disappeared in the language of literature, but without the power of advancing or of being enriched by the products of deep thinking; and though they may abound in single expressions of great beauty and delicacy, the general character comes to be low and coarse. But so long as a language lives, the literary standard and the dialects never cease to act and react on one another.

The chief points of difference between the dialects of a language and the standard fall under four heads. The first consists of differences in the elementary sounds or letters, each dialect having a tendency to substitute some one or more vowels or consonants for others. Thus, the standard English *bold*, is in Ireland *bowld;* in Scotland, *bauld; what*, where the *h* is nearly evanescent, becomes, in a Scotsman's mouth, or rather throat, *chwat*, and in Aberdeenshire Scotch, *fat—f* in this sub-dialect being regularly substituted for *wh*, or rather *hw*. 2. Each dialect has peculiarities of grammar: In many parts of England and in Scotland, the plural of *eye* is not *eyes*, but *eyen*, or *een*, like *oxen*. The habitual use of *be* where the standard grammar prescribes *am*, *is*, *are*, &c., is prevalent in large districts of England. Of this kind is the use of the strong conjugation for the weak, or vice versâ; as *loup*, *lap*, *luppen*, for *leap*, *leaped*, *leaped*. 3. Peculiarities of vocabulary: These individual words current in one or more districts, but unknown to the standard vocabulary, are properly *provincialisms*. They are generally genuine words of an older stage of the language, that have survived longer in some localities than in others. Some provincialisms, as *bearn* or *bairn*, for child, *marrow* for fellow or match, to *greet* for to weep, are common to Scotland and the north of England. Others are more local, as to *cleam*, for to fasten or cement; *heppen*, a Yorkshire term for pretty near; *thrippa*, in Cheshire, to cudgel. The exclusion of such words from the standard language is often accidental, and many of them might be and are with advantage resumed; ex., *marrow, gloaming*, &c. 4. Peculiarities of intonation: This is sometimes, though with little propriety, called accent, which means strictly the stress laid upon a particular syllable of a word. There are no doubt local peculiarities of this kind too. The tendency of standard English, especially the more recent, is to throw the accent toward the beginning of the word; in Scotland, the tendency lingers to say *envy'* for *e'nvy*. But peculiarities of intonation lie in the different ways in which the *pitch* of the voice is managed—in the musical accompaniment of articulation. Differences in this respect give rise to the monotonous drawl of one district, the angry querulous tone of another, the sing-song of a third, &c.

So long as dialectic varieties of language were looked upon indiscriminately as corruptions and barbarities, they were only noticed by scholars that they might be avoided. A more rational philology, without trenching upon the rules of good writing, considers them as essential parts of the speech of a people, and a knowledge of them as necessary to any thorough investigation of the genius of that speech.

It is obvious that *Dialect* is entirely a *relative* term, and that what we call by that name in one connection, we may call a language in another connection. Thus, Greek and Latin may be called sister-dialects of that primitive language from which it is held that they, as well as the other members of the Indo-European family, branched off. See ARYAN LANGUAGES. Speaking of Greek by itself, however, it is a language, and Ionic, Doric, Attic, &c., are dialects of it. The same holds good with the others. In practice, however nearly related the speech of two peoples may be, we do not apply the term dialects, unless the peoples are mutually intelligible and have a common literary standard. Intelligibility does not go for much, but political relations enter more or less into the notion. Thus, Scotch is sometimes spoken of as a distinct language from English; and yet in no part of Scotland is the common speech so unintelligible to an Englishman as is that of Somerset, which is always a 'dialect.' This arises from Scotland being thought of as a separate country, which it once was; and its speech as the vehicle of a peculiar literature. See AMERICANISMS.—Dialect is not to be confounded with artificialities, such as the jargon of thieves.

**DIALE'CTIC** is a Greek word which signified originally 'the art of conversation,' but came to have a technical signification in the language of philosophy. At first, it implied a regular and scientific method of treating general conceptions or general terms—a sort of anatomy of names, and through them of the things denoted. In the Socratic philosophy, and more especially in that of Plato, dialectic was thus the method of the highest and deepest kind of speculation. Aristotle gave another signification to the word. According to him, a scientific proof or deduction is different from a dialectic proof, which is only a probable deduction. After this, dialectic came round to imply a sort of word-fence, the art of so using the forms of reasoning as to confound your opponent, and make fallacies pass for truth. Dialectic is sometimes used as synonymous with logic. Logic, however, which originated with Aristotle, is properly the science of the forms of thinking; it is less directly concerned with words than dialectic, which in this view becomes a subordinate province of logic—the art of disputation. Dialectic, in fact, is little heard of where philosophy is positive and experimental; it is chiefly used with regard to the more ideal and *à priori* speculations of such philosophers as Kant, Hegel, Schelling, &c.

**DI'ALLAGE**, or **SCHILLER-SPAR**, a mineral nearly allied to Augite (q. v.), and by some regarded as a variety of it. Its chemical composition is essentially the same. It is seldom found very perfectly crystallised, but usually massive, granular, or disseminated. It has generally a metallic and pearly or silky lustre. A very beautiful bright green D. (smaragdite), found in Switzerland, Italy, Corsica, India, Labrador, &c., is prized for ornamental purposes; in Corsica, it occurs disseminated in a felspar (*Labradorite* or *Saussurite*), which when cut and polished, appears spotted with it, and is of great beauty, is made into boxes, vases, &c., is much valued, and is known by the names *Gabbro* and *Verde di Corsica duro*. A variety of D., usually of a yellowish or brownish colour, is sometimes called *Bronzite*.

**DI'ALOGUE**, a conversation between two or more persons, implying, however, greater unity of subject and formality than an ordinary conversation. The ancient Greek philosophers were fond of this way of conducting their investigations and conveying their instructions. The Socratic dialogue is a conversation in the form of question and answer, so contrived that the person questioned is led himself to originate those ideas that the questioner wishes to bring before him. The dialogues of Plato are, as it were, philosophical dramas, in which the Socratic method of investigation is brought to bear upon speculative subjects. The form of the dialogue is but ill adapted to the modern state of science. Of the more eminent modern writers in this form, we may mention Erasmus in Latin; Lessing, Herder, and Wieland among the Germans; Petrarch and Machiavelli in Italy; Fénelon and Fontenelle in France; and Berkeley, Hurd, and Harris in England. Landor's *Imaginary Conversations* are a happy effort of this kind. When dialogue is combined with action, we have the drama.

**DIAMA'GNETISM.** The fact that iron is attracted by the magnet, has been known from very remote times; that bismuth exhibits a repulsive action towards the magnetic needle, has been now known for nearly 100 years. Dr Faraday was the first (1845) to shew that all bodies are more or less affected by magnetic influence, and his beautiful researches on the subject have opened up a new field in the domain of science. He found that the magnetism of bodies was manifested in two ways—either in being attracted by the magnet, as iron; or in being repelled, like bismuth. When a needle or slender rod of iron is suspended between the poles of a magnet, as in fig. 1, being attracted by them, it takes up a position of rest on the line *ab*, joining the two poles. When a substance behaves itself in this manner, it is said by Faraday to be *paramagnetic*, and to place itself *axially*, *ab* being the axis. A rod of bismuth, on the other hand, being repelled by the poles of the magnet, comes to rest in the line *cd*, at right angles to *ab*. Bismuth, and the like substances, he calls *diamagnetic,* and they are said to place themselves *equatorially*, *cd* being the equator. These terms, being both definite and graphic, have been universally adopted. Magnetic is the term used by Faraday to indicate magnetism of either sort, although in general language it is understood to refer to paramagnetic bodies, such as iron, &c. Paramagnetic bodies, then, are those which manifest the same properties with regard to the magnet that iron does; and diamagnetic bodies are those which, like bismuth, shew opposite but corresponding properties; so that in circumstances where paramagnetic bodies place themselves axially, diamagnetic bodies place themselves equatorially; and where the former are attracted, the latter are repelled, and *vice versâ*. A paramagnetic, therefore, not in the elongated form, but in a compact shape, such as a ball or cube, is attracted by either pole of the magnet, when suspended near it; a ball or cube of a diamagnetic, on the other hand, experiences, when so placed, repulsion. The paramagnetism of iron, nickel, and cobalt, becomes manifest in the presence of magnets of ordinary power; but the magnetism of most other substances is so feeble as to be developed only under the influence of the strongest magnets. As electro-magnets far exceed permanent steel magnets in strength, they are selected for investigations on the magnetism of bodies. Fig. 2 represents an electro-magnet which may be employed for this purpose.

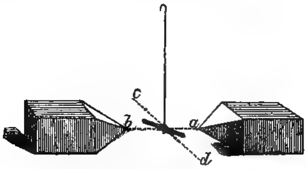


Fig. 1.

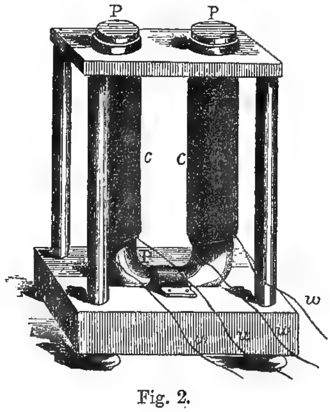


Fig. 2.

The soft iron horseshoe PPP, enveloped towards its extremities in the coils of insulated copper-wire *cc*, which communicate with a galvanic battery by the wires *w*, is fixed in an upright wooden frame. The ends or poles of the magnet rise slightly above the table or board which forms the upper part of the frame. In order conveniently to suspend substances between the poles, and to protect them while under observation from currents of air, a glass frame of simple construction, fig. 3, is made to fit the table. The upper plate of the frame admits a wooden ring, into which an upright glass tube is fitted. The thread by which the needle is suspended is wound round a slender movable bobbin at the top, so that it can be elevated or lowered to the proper position. To modify and direct the action of the magnet, two pieces of soft iron (fig. 1) are made to rest on the end faces; these are pointed at one extremity, and flat at the other, so that the force of the magnet may be concentrated in the points, when they are turned towards each other; or diffused over the opposite flat surface, when their position is reversed.

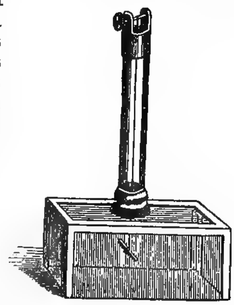


Fig. 3.

To observe the effect of the magnet on liquids, Faraday placed them in long tubes of very thin glass, and suspended them as in the case of solid needles. It was found that some arranged themselves axially, and others equatorially. The attraction and repulsion that liquids experience in the presence of the magnet has been prettily shewn by Plucker. A large drop of liquid is placed in a watch-glass, figs. 4, 5, and laid upon two poles of the shape shewn in the figures. If the liquid be paramagnetic, the surface becomes depressed at the interval between the poles, and heaped up over the extreme edges of them, fig. 4. A diamagnetic liquid, on the other hand, shews a depression at each edge of the poles, and a heaping up at the centre, fig. 5.

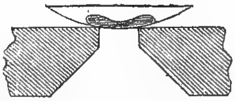


Fig. 4.

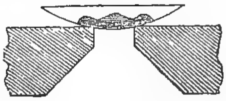


Fig. 5.

The magnetic nature of flames and gases has been also studied. When the flame of a candle is brought between the poles of a magnet, it is repelled by them, and thrown out horizontally into an equatorial position. To ascertain the magnetism of gases, Faraday inflated soap-bubbles with them, and their para- or dia- magnetism was exhibited by their being attracted or repelled by the poles. He ascertained the same by causing the gases to flow out from glass tubes in the presence of the poles, when the peculiar magnetism of the gas was shewn by its choosing an axial or equatorial means of egress.

The following list gives the kind of magnetism displayed by the more common substances:

*Paramagnetic.*—Iron, nickel, cobalt, manganese, chromium, titanium, palladium, paper, sealing-wax, peroxide of lead, plumbago, red-lead, sulphate of zinc, shell-lac, vermilion, charcoal, proto and per salts of iron, salts of manganese, oxygen, air.

*Diamagnetic.*—Bismuth, antimony, zinc, tin, cadmium, sodium, mercury, lead, silver, copper, gold, arsenic, uranium, tungsten, rock-crystal, mineral acids, alum, glass, litharge, nitre, phosphorus, sulphur, resin, water, alcohol, ether, sugar, starch, wood, bread, leather, caoutchouc, hydrogen, carbonic acid, coal-gas, nitrogen.

The nature of the medium in which the body under examination moves, exerts a powerful influence on the nature and amount of the magnetism it exhibits; thus, if a glass tube be filled with a solution of the proto-sulphate of iron, and suspended between the poles, it will place itself axially. It will do the same if made to move in water, or a solution more dilute of the proto-sulphate of iron. It will be indifferent in a solution of the same strength; but it will place itself equatorially in a stronger solution. Thus, the same substance may appear paramagnetic, indifferent, or diamagnetic, according to the nature of the medium in which it moves. As a general rule, a body shews itself paramagnetic towards one less paramagnetic than itself, indifferent towards one equally magnetic, and diamagnetic towards one more paramagnetic than itself. The same takes place, *mutatis mutandis*, with diamagnetic substances. This has given rise to the theory, that there is no such thing as diamagnetism *per se*, and that bodies are diamagnetic only in media of greater paramagnetic power than their own. This view of the case is, however, rendered highly improbable from the fact, that diamagnetism is exhibited as decidedly in a vacuum as in any medium, and a vacuum cannot be supposed to possess magnetic properties of any kind.

**DIAMANTI'NO**, a significant name in the diamond districts of Brazil, indicates a river and two towns.—1. The river, apparently an affluent of the Paraguay, and, through it, of the Plate, rises in the province of Matto Grosso, being joined by the Ouro 70 miles to the north-north-west of Cuyaba.—2. Of the two towns, the more westerly stands at the confluence above mentioned, having a population of 4500.—3. The more easterly town, again, is in the province of Minas Geraes, and stands amid the head-waters of the St Francisco at an elevation of 5700 feet above the sea. It has about 14,000 inhabitants.

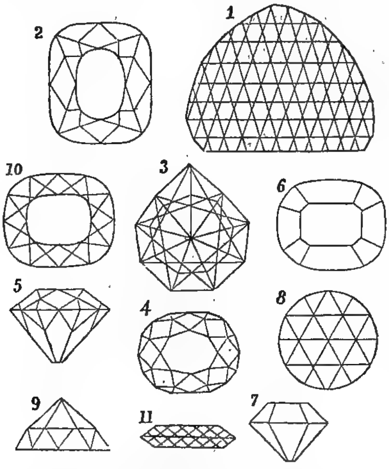
**DIA'METER**, in Geometry, is generally used in speaking of curves, and its most general definition is, a straight line bisecting all parallel chords in a curve. In the circle, ellipse, and hyperbola, all diameters pass through the centre, and are there bisected. Only the circle has all diameters equal; and each bisects the chords at right angles to it. In the ellipse, this last is only the case with the two diameters called the major and minor axes. In the parabola, all diameters are parallel to the axis. Many curves of the higher orders have no diameter at all.

We speak also of the diameters of solid bodies of a round shape. In the sphere, lines passing through the centre are diameters, and so in the ellipsoid; they are all bisected in the centre.

**DI'AMOND** (corrupted from Gr. *adamant*, untamable, refractory), the most highly valued of precious stones, and the hardest of all known substances. It consists of Carbon (q. v.), a simple or elementary substance, crystallised, and in its greatest purity. Diamonds are commonly colourless and clear like water; although sometimes, from some slight foreign intermixture, they are white, gray, yellow, green, brown, and more rarely orange, red, blue, or black. The lustre is adamantine and very high; the transparency perfect in specimens perfectly free from foreign substances, the presence of which, however, even in very small quantity, mars it, and sometimes almost produces opacity. The D. becomes positively electric by friction, but is not electrified by heat, a test which sometimes serves to distinguish it from the topaz. Its specific gravity is about 3·6. Its primary form is a regular octahedron, but it appears also in rhombic dodecahedrons; and its crystals often have curvilinear faces and edges. Its structure is distinctly lamellar. It burns before the blow-pipe in air or in oxygen gas, combining with oxygen to form carbonic acid. Its hardness renders it incapable of being scratched by any other substance, and in cutting and polishing diamonds, diamond-dust is employed. The estimation in which it is held as a precious stone is due to its remarkable hardness, rarity, and brilliancy. The art of cutting diamonds, although long practised in India and China, was not known in Europe till after the middle of the 15th c., when it was discovered by Louis van Berguen of Bruges. Previous to that time, diamonds were set without being cut, and in that state they have often a rough, dull, and uneven surface. Diamonds are indeed found not only in the form of perfect crystals, but also in rolled grains; and they are obtained partly from alluvial soils and the sands of rivers, and partly from rocks, chiefly a quartzy sandstone or conglomerate, in which they are often associated with gold. A number of localities in India have long been celebrated as productive of diamonds, particularly Golconda (q. v.); they are found also in Malacca, Borneo, and other parts of the East; nor were any diamonds procured in any other part of the world till the beginning of the 18th c., when they were discovered in remarkable abundance in the district of Serra do Frio, in the province of Minas Geraes in Brazil. Previous to that time, diamonds found in Brazilian gold mines had been disregarded as mere pebbles; their nature became known in consequence of some of them accidentally finding their way to Europe. In 1829, they were discovered in the Ural Mountains. They have also been found in Rutherford county, North Carolina; in Hale county, Georgia; in the province of Constantine, Algeria; and in Australia. Diamond mines consist in general of mere diggings and washings of alluvial deposits. In Brazil, the method pursued is to rake the alluvial matter backwards and forwards on inclined planes, over which a stream of water is made to run, till the lighter particles are carried away, when large stones are picked out by the hand, and what remains is carefully examined for diamonds. The work is carried on by slaves, and when a diamond of seventeen carats is found, the slave who finds it is entitled to his liberty. Large diamonds are comparatively rare among those of Brazil, all the notable diamonds in the world being Indian. Brazil produces yearly from 25,000 to 30,000 carats of diamonds, of which, however, not more than 9000 carats are capable of being cut, the rest being either very small or of inferior quality. The small and inferior diamonds are called BORT, and command a ready sale for their use in the arts, being pounded in a steel mortar, and much employed in the form of diamond-dust by lapidaries for cutting and polishing diamonds and all kinds of gems, and even for polishing rock-crystals for spectacles. Minute fragments or splinters of bort are also used for making fine drills, which are used for drilling small holes in rubies and other hard stones to be employed in watch-making, gold and silver wire-drawing, &c., and for piercing holes for rivets in china, in artificial enamel teeth, &c. The use of small diamonds by glaziers for cutting glass is well known. The diamonds so used are uncut, and they are so mounted as to act upon the glass not by an angle, but by a curvilinear edge of the crystal. The cut is only to the depth of about one two-hundredth part of an inch, but is sufficient to make the glass readily break in accordance with it.

Diamonds are cut into various forms, but principally into *brilliants* and *rose diamonds*. The *brilliant* cut is the most expensive and difficult, but is also that which best brings out the beauty of the stone: it has an upper or principal octagonal face, surrounded with many facets, and other things being equal, the greater the number of facets the more valuable is the diamond. The lapidaries of the East, however, sometimes multiply facets to hide imperfections of the stone. *Rose diamonds* have a flat base, above which are two rows of triangular facets, the six uppermost uniting in a point. Rose diamonds are made of those stones which are too broad in proportion to their depth to be cut as brilliants. Stones still thinner are cut as *table diamonds.* The art of sawing diamonds, when too thick in proportion to their surface, was invented by a Dutchman named Dalbeck in the beginning of the 19th century.

The value of diamonds is variously estimated. The rule generally given is to square the number of carats the diamond weighs, and then to multiply by the price of a single carat. Thus, a rough diamond of 12 carats weight, one carat being estimated at £2, would cost 12 × 12 × 2 = £288. The value of a diamond is much increased by its being cut, although the actual weight is diminished. Beyond a certain weight, no rule of calculation can be applied, owing to the limited number of purchasers, and the most fabulous values have been assigned to famous diamonds. The price of diamonds is now less than it once was.



Diamonds:
1, the Koh-i-noor; 2, Regent or Pitt Diamond; 3, Grand Duke; 4, 5, vertical and lateral appearance of the brilliant diamond; 6, 7, vertical and lateral appearance of the brilliant diamond before being recut; 8, 9, vertical and lateral appearance of rose-cut diamond; 10, 11, the table cut diamond.

There is a way of falsifying diamonds by joining an under part of some other stone to an upper part of genuine diamond. Some varieties of Sapphire, Hyacinth, and Topaz, are often passed off for diamonds. The first two may be distinguished by their greater specific gravity, the latter by its becoming electric when heated. Rock-crystal, and glass or 'paste' imitations, are lighter than true diamonds, and less hard and brilliant. The best test of a genuine diamond is hardness. Care must be taken, however, to avoid breaking off its angles, in attempting to test it by scratching other substances with it, as, notwithstanding its hardness, it is somewhat brittle.

Some particular diamonds, from their unusual magnitude, or from circumstances of their history, are of such interest as to entitle them to notice. The collection of the emperor of Brazil is said to contain an uncut diamond—the Braganza diamond —of the enormous weight of 1680 carats, or about 12 ounces; but it is suspected to be only a fine colourless topaz.—The largest diamond certainly known is that belonging to the rajah of Mattan, weighing 367 carats. It is egg-shaped, with an indented hollow near the smaller end. Many years ago, the governor of Borneo offered for it 500,000 dollars, two war-brigs fully equipped, a number of cannon, and a quantity of powder and shot. But the rajah refused to part with it, the fortunes of his family being supposed to be connected with it, and the Malays ascribing to water in which it has been dipped the power of healing all diseases.—Next to this diamond in size, ranks the celebrated Koh-i-noor (q. v.), once a boasted possession of the Great Mogul, and now belonging to the Queen of Great Britain. It weighs 279 carats; but is said to have weighed in the rough state 900 carats.—The Orlow diamond, belonging to the Russian emperor, and which was once the eye of an Indian idol, is said to have weighed, when rough, 779 carats, but is now cut, egg-shaped, and weighs 195 carats.—The Regent diamond, or Pitt diamond, which weighs in its cut state 136¾ carats, is unrivalled in its limpidness and its form, its diameter and depth being nearly equal. It was found in Golconda, was brought from India by an English gentleman named Pitt, the grandfather of the first Earl of Chatham, and by him sold to the Duke of Orleans for £130,000. It decorated the hilt of the sword of state of the first Napoleon, was taken by the Prussians at Waterloo, and now belongs to the king of Prussia.—The Sanci diamond, weighing 106 carats, has a still more interesting history. It belonged to Charles the Bold, Duke of Burgundy, who wore it in his hat at the Battle of Nancy, where he fell. A Swiss soldier found it, and sold it to a clergyman for a gulden. It passed into the possession of Anton, king of Portugal, who was obliged to sell it, the price being 100,000 francs; and it shortly afterwards became the property of a French gentleman named Sanci, whose descendant being sent as ambassador to Soleure, King Henry III. required the diamond as a pledge; but the servant who was carrying it to the king was attacked by robbers on the way and murdered, not, however, till he had swallowed the diamond. His master, fully confident of his faithfulness, caused his body to be opened, and found it in his stomach. This diamond came into the possession of the crown of England, and James II. carried it with him to France in 1688. Louis XV. wore it at his coronation. In 1835, it was purchased by a Russian nobleman for half a million of rubles (£80,000). The Sanci diamond is said to have been the first diamond which was cut in Europe.

**DIAMOND BEETLE** (*Curculio imperialis*), a beetle or coleopterous insect of the tribe to which the name WEEVIL is generally appropriated, but

Diamond Beetle (*Curculio splendens*).

remarkable for the splendour and exquisite beauty of its colours, in which it is thought to be unrivalled even among coleopterous insects. It is of a golden-green colour, with two black longitudinal bands on the thorax, and several rows of depressed spots on the elytra (wing-covers), which exhibit a beautiful and sparkling green with intervals of black. It is a native of warm parts of South America.

**DI'AMOND HARBOUR**, the port of Calcutta for large ships, is situated on the left side of the Hoogly, about 30 miles below the capital, with which it is connected by an excellent road and by electric wires. As the adjacent country is swampy and unhealthy, the spot is marked only by a few native huts. The commercial value of the locality, however, is likely to increase, in proportion as the silting up of the river above impedes the upward navigation.

**DIAMOND NECKLACE**, The, a wonderful piece of jewellery, made in Paris about the year 1775, and intended for Madame Du Barry, the favourite of Louis XV. She, however, was excluded from court on the death of Louis (1774), and before the necklace was finished. After being made, this beautiful ornament, adorned with 500 diamonds, was discovered to be so costly that no one could purchase it. It was valued at 1,800,000 livres, which in present sterling money is equal to about £80,000.

The Prince Cardinal de Rohan, a wealthy, vain, and profligate man, persuaded by a woman named De Lamotte, who waited about court, that the queen (Maria Antoinette) regarded him with an eye of favour, became so infatuated with the idea, that he was ready to do anything, however extravagant, in order to preserve this feeling in the queen. De Lamotte had stated to the cardinal that the queen was desirous of obtaining this glorious necklace, and that not having sufficient money just then, she would sign an agreement to purchase it if the cardinal would become security. The cardinal consented. The agreement was approved of and signed with the royal signature, as also with that of the cardinal, who, on the 1st February 1786, carried off the treasure to Versailles, where it had been agreed the queen should send for it. On the following day, a person, dressed in the uniform of one of the court valets, entered the apartments of the cardinal, and repeating as he entered the words, *de par la reine*, 'in the name of the queen,' he advanced to the table whereon the casket containing the treasure lay, and bore it away. In a few days De Lamotte, her husband, and the *soi-disant* valet, having all disappeared from Paris, were busily engaged separating the diamond necklace into portions, and selling them. The whole transaction had been a trick; the messages from the queen, verbal and written, were without foundation, the latter, indeed, being forged by the 'valet,' who was skilled in imitating handwriting. The plot was discovered by means of the maker of the diamond necklace, who, not receiving any money when the period of the first instalment had arrived, went to court, demanding to know if the necklace had been delivered to the queen. In a few months the cardinal found himself in the Bastile, where those by whom he had been duped were already sent. In May 1786, the trial of the prisoners was brought to a close. De Lamotte was branded on each shoulder with the letter V (for *voleuse*, thief), and was sentenced to be imprisoned for life. All the others were acquitted. The queen was falsely supposed by the populace of Paris to have been implicated in the plot, and the odium resulting from it was cast upon her, even at the last, when she sat on the cart that bore her through a raging and cursing mob to the guillotine.

**DIA'NA**, a Roman goddess, corresponding in most of her attributes to the Grecian Artemis. According to the myths, she was the daughter of Jupiter and Latona, and the twin-sister of Apollo. She was born, along with her brother, on Mount Cynthus, in the isle of Delos, which till then had been a floating island, but was fixed by Neptune in its present place, that Latona might there give birth to her children in peace and safety from the persecutions of the jealous Juno. D. was worshipped by Greeks and Romans alike, as both a destroying and a preserving goddess. In the former capacity, she was represented as a full-grown virgin, armed with bow and arrows, with which she avenged herself on her enemies; as a preserving deity, she watched over the sick, and helped the unfortunate. Young girls, and women in childbirth, were the objects of her special care. She was herself beyond the allurements of love; and the ministers of her worship were vowed to lives of the strictest chastity. As sister of the sun-god Apollo, D. was regarded as the goddess of the moon; hence her Greek name *Selene*, and her Latin names *Lucina* and *Phœbe*. Her worship was conducted with splendid rites in different cities. Her temple at Ephesus was one of the seven wonders of the world. In Tauris (the Crimea), she was propitiated with sacrifices of human victims; and before her statue at Sparta, the public scourging of the Lacedemonian youth used to take place. In Arcadia, she was looked upon as the special patron of hunting and all sylvan sports, and as such was represented in Greek works of art as a tall and handsome maiden, with long hair floating down her neck, drawing an arrow from her quiver with one hand, and with the other holding in a struggling deer. As goddess of the moon, she wears a long robe reaching to her feet, and bears on her brow a crescent moon.

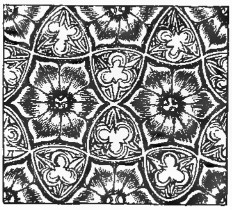
Diana.

**DIA'NO**, a town of Naples, in the province of Principato Citra, 45 miles south-east of Salerno. It occupies a beautiful situation on an isolated hill overlooking the river Calore, and in the fertile vale of Diano, which takes its name from the town. It has a castle of some strength, several churches, and a population of 7000.

**DIA'NTHUS**. See Pink.

**DIAPA'SON**, a term in music by which the ancient Greeks designated the octave. In modern music, diapason is used to denote the range, or compass of the voice, or of an instrument. The French use the term as equivalent to *pitch*. Diapason is also the name given by English organ-builders to certain stops of pipes in the organ, of eight feet pitch, which are considered the fundamental stops, of which there are generally two—a stopped diapason and an open diapason on each manual. See ORGAN-BUILDING.

**DI'APER** (Ital. *diaspro*), a term derived from *jasper* or *diasper* (see letter D), which stone being much used in ornamenting jewellery, originated the Mid. Lat. name *diasprus*, for a texture ornamented or variegated in an analogous way. In textile manufactures, the term is applied to fabrics with patterns of geometrical regularity, such as are produced by the kaleidoscope, woven in their texture, and produced with shafts and heddles, without the Jacquard machine. In Architecture, DIAPER-WORK, or DIAPERING, is a kind of decoration applied to plane surfaces, and consists of a small pattern either of flowers, leaves, or arabesques, carved or painted. The flower, or other object, is generally enclosed in a small frame; and these frames, which touch each other at the edges, constitute in themselves a sort of mathematical diapering. When the pattern is carved, it is generally sunk; and when painted, it consists of a darker shade of the same colour as the plane surface, by which the effect of shadow is communicated to it. The accompanying illustration, from Bloxam's *Gothic Architecture*, exhibits a very beautiful example of decorated English diapering. It is taken from Canterbury Cathedral.


Diaper.

DIAPRÉ is applied in Heraldry to fields and charges, relieved by arabesque and geometrical patterns. These patterns were generally of a darker shade of the same tincture. This being merely an ornamental device, not affecting the heraldic value of the objects to which it was applied, was generally left to the fancy of the painter.

**DIAPHA'NOSCOPE** (Gr. *diaphanos*, transparent; *skopeo*, I see), a dark box, suitably constructed for exhibiting transparent photographs or other pictures. It may or may not be furnished with a lens.

**DIAPHORE'SIS** (Gr.), the cutaneous perspiration, whence

**DIAPHORE'TICS**, remedies to excite the secretions of the skin. The simplest of all diaphoretics are baths, which may be either warm baths of water, or of vapour, either simple or medicated. See BATHS. The most powerful of all, however, as regards educing perspiration, is probably the so-called Turkish bath, which consists essentially in the use of a sweating process, by means of air heated to a temperature of 140°, or even more. The following remedies, used internally, are powerful diaphoretics: antimony, ipecacuanha, opium (these three either singly or in combination); ammonia, and the carbonate or acetate of ammonia (spirit of mindererus), sarza, guiacum, dulcamara, and sassafras. On most of these substances, special articles will be found. A favourite formula is Dover's powder, consisting of a grain of opium, and a grain of ipecacuanha in each ten grains of the powder. This in doses of from five to eight grains, followed by warm drinks and plenty of blankets in bed, usually produces copious perspiration, and is very soothing and useful in many commencing inflammatory and febrile complaints. James's powder, in doses of from three to eight grains, is often added to the above in domestic prescriptions; but neither of these medicines should be used rashly, as in certain states of the system they may prove dangerous; and they should never be given to very young children.

**DI'APHRAGM** (Gr. *diaphragma*, a partition). This is the name applied in anatomy to designate the transverse muscle which, in man and the mammalia generally, separates the cavity of the thorax or chest from that of the abdomen or belly. It is not easily described, but will be best understood by a reference to the accompanying figure (fig. 1). In form, it is nearly circular; it is fleshy at its edges, tendinous in its centre, and ending in a point below. In front, it is attached to the ensiform cartilage of the sternum, or breastbone; laterally, to the inner surfaces of the six lower ribs; and posteriorly, to two tendinous arches on either side, termed the *ligamenta arcuata*, and to the anterior surface of the bodies of the second, third, and fourth lumbar vertebræ on the right, and only the second and third on the left side; these origins from the vertebræ forming two large fleshy bellies (termed the *crura*), which ascend to join the central tendinous portion. The diaphragm presents three principal openings: one quadrilateral, in the tendinous centre, for the upward passage of the inferior vena cava; one of an elliptic shape, formed by the two crura for the œsophagus and pneumogastric nerves; and a third for the aorta, the azygos vein, and the thoracic duct.

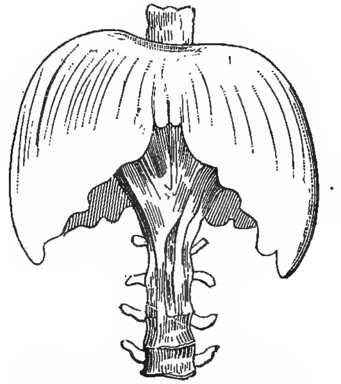


**Fig. 1.—The Diaphragm in a state of repose.**
Anterior view.

The diaphragm is in relation superiorly with the pleuræ and pericardium, enclosing the lungs and heart; inferiorly, on the left side with the stomach and spleen, on the right with the convex upper surface of the liver; posteriorly, with the kidneys and supra-renal capsules and the duodenum; and by its circumference with the ribs and intercostal muscles, with the sternum, and with the vertebral column.

We see from figure 1 that it is convex superiorly, and concave inferiorly. When it contracts, its upward convexity approximates to a plane surface, and the cavity of the chest being thus enlarged, air rushes in to fill the partial vacuum, and expands the lungs during the act of inspiration (fig. 2). It is thus an inspiratory muscle, and is the sole agent in tranquil inspiration. The enlargement of the thoracic cavity caused by the contraction of the diaphragm, must obviously be associated with a corresponding diminution of the abdominal space. Hence this muscle, by its action on the abdominal viscera, aids in the expulsion of the fæces and urine.

Spasmodic action of the diaphragm produces hiccough and sobbing; and in laughing, the alternate contractions and relaxations of this muscle occur with increased rapidity. Stoppage of the action of the diaphragm, whether from great external pressure or from paralysis, is very speedily fatal.

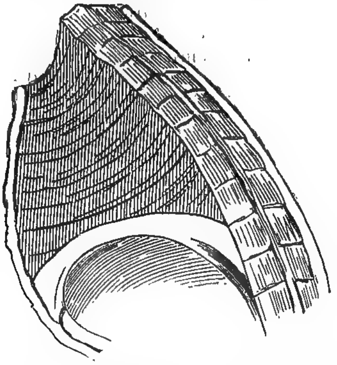


Fig. 2.—The Diaphragm in a state of contraction. View of lateral section.

**DIAPHRAGM**, a partition with a hole in it, employed, not only in landscape and portrait lenses for photography, but also in telescopes, microscopes, and other optical instruments, for the purpose of cutting off the superfluous rays of light, and producing greater intensity or sharpness of the image, as well as to correct aberration.

**DIAPHRAGM SHELL.** See Shell.

**DIA'RBEKIR**, a town of Asiatic Turkey, capital of a pashalic of the same name, is situated on the right bank of the Tigris, at a short distance from the river, the intervening space being occupied by rich gardens; lat. 37° 55′ N., long. 39° 52′ E. The town, which is circular in shape, covers a considerable area, and is surrounded by high strong walls, flanked with towers, and pierced by four gates. The streets are dirty, and the houses for the most part are built of rough stone, plastered with a composition of mud and straw, but some of the better class are of black basalt. It has numerous handsome mosques, khans, and bazaars, and five Christian churches. Extensive manufactures of silk, cotton, and other goods, affording, with an active commerce between Aleppo and Bagdad, employment to about 40,000 families, were at one time carried on here; but the manufactures and trade have now greatly declined, and the population of D. does not amount to more than 8000 families, 6300 of whom are Turkish, the rest being Greek, Armenian, Catholic, and Jewish. The silk manufacture, which is now the staple, is said to be improving. D. occupies the site of the ancient *Amida*, which was a place of importance in the reign of Constantius, by whom it was strengthened and enlarged. In this reign it was taken by the Persians, from whom it was again captured by the Romans; but in 502 the Persians once more became masters, and put 80,000 of the inhabitants to the sword. After many vicissitudes, it passed into the hands of Sultan Selim in 1515. Many Roman and Saracenic remains still exist here.

**DIARRHŒ'A** (Gr. *dia*, through, and *rheō*, I flow), a disease, or rather a tribe of diseases, characterised by an increase in the discharges from the bowels, which are usually unduly liquid, sometimes overcharged with bile, and sometimes the contrary. Diarrhœa has many varieties and many causes; but the whole tribe of diarrhœal diseases present certain relations in common, which have been studied of late years to a considerable extent from the preventive or sanitary point of view. Thus it is observed of all of these diseases, without exception, that they are more apt to prevail during summer and autumn than during the earlier seasons of the year; and it is also well established that their prevalence is to a great extent dependent on the intensity of the solar heat, so that a temperature above 60° F. seems to be almost essential, under ordinary circumstances, to their epidemic diffusion. Moreover, it has been shewn that the decomposition of organic matters in the neighbourhood of human dwellings, and the introduction of the products of decomposition into the food, drink, or air used by the healthy, has been a direct exciting cause of diarrhœa in a great number of instances where the disease has been locally epidemic; from which it is inferred that the real source of diarrhœal diseases is usually to be found in a morbid poison closely associated with the process of putrefaction, although not, perhaps, necessarily generated during that process. It has been noticed that cold and wet seasons are the least favourable to the production of diarrhœa, which is explained on the theory above alluded to by the rapid removal in such seasons of all organic débris; and there is little doubt that this explanation is correct, as the converse is equally true, the combination of heat with long-continued drought being almost sure to waken into life the epidemic seeds of diarrhœa. Again it is noticed that where drainage is imperfect, and drinking water impure, diarrhœal diseases are specially apt to occur (see Cholera); the class of the population most apt to be affected being those who occupy low levels, or who are otherwise exposed to the influence of this aqueous or gaseous poison. Infants are especially apt to suffer from diarrhœa, and a large number of the infantile deaths in many English towns are caused either directly by this disease, or by the abuse of stimulants and narcotics for its cure.

Diarrhœa is either simple, bilious, or choleraic; the last form has already been discussed. See Cholera. The ancients applied the name *lientery* to a diarrhœa in which the dejections consisted of matters not digested, or very partially so; this form is, however, very unusual, at all events in this country. Dysentery (q. v.) is also a form of diarrhœal disease; as is the form of fever (q. v.) called gastric, typhoid, or enteric fever. Simple and bilious diarrhœa probably often differ only in degree; they are both distinguished from the advanced stages of cholera and dysentery by the presence of abundance of biliary colouring matter in the stools, and by the absence of the distinctive features of the other two diseases as described elsewhere. Diarrhœa frequently depends on organic disease, either of the intestines themselves, or of the liver, kidney, or spleen. It is also one of the most common symptoms of the advanced stage of consumption (q. v.).

When diarrhœa is plainly the consequence of improper food or drink, when it is very recent, when the strength of the patient is not much impaired, when there is much griping pain or distension of the belly, when the evacuations are very unnatural in character, and especially when they are dark coloured and very fetid; when the disease has been preceded by habitual constipation (q. v.), and when there is no organic disease to be discovered, it is well to let diarrhœa run its course, at all events for a time, and either to aid it by small doses of very simple laxatives, or, at all events, to abstain from hastily checking the discharge, which in these cases is to be regarded as a truly curative and beneficent process, calculated to disburden the system of some poisonous or deleterious substance, and only requiring time for the restoration of the patient to health. In other cases, especially of febrile diarrhœa, an emetic of ipecacuanha at the very beginning will sometimes remove the disease with remarkable rapidity; and in most forms of diarrhœa it may be alleged that this medicine (in doses of from one to five or even ten grains) is well borne. Sometimes it is combined with opium in the form of Dover's powder. Vegetable astringents, as catechu, kino, tannin, matico, logwood, are also much employed both in acute and chronic cases; some prefer the acetate of lead, with opium (which, however, is perhaps more suitable to dysentery). It should be observed that in some forms of diarrhœa the use of opium, though a most powerful remedy, is contraindicated by the state of the constitution; it should in no case be largely given without medical advice. In many chronic cases the metallic tonics and astringents are of service—e. g., iron, sulphate of copper, zinc, and bismuth. In a very large class of cases, especially of infantile diarrhœa, depending upon a too acid state of the secretions, the leading remedy is chalk, either in powder or in the very serviceable form of the mistura cretæ (mixture of chalk) of the pharmacopœias, from one to three dessert spoonfuls of which may be given after every disturbance of the bowels. Lime-water, mixed with milk in the proportion of one to four or five, is easily given to very young children, and serves nearly the same purpose.

**DI'ARY** (Lat. *diarium*, from *dies*, a day), means simply a daily record. It does not, however, comprehend every sort of daily record, but only such as have reference to the writer personally. In it the *littérateur* inscribes the daily results of observation, reading, or thought; to the mercantile man, it serves the purpose of an order or day book; while the physician finds it indispensable as a register of engagements. The use of diaries has become so general, especially in England, that the making of them now forms an important branch of the book-manufacture. Letts and Co., of London, issue annually upwards of a hundred varieties of diary, from the large folio to the smallest pocket volume. The usual diary may be described as a book with a separate blank space for every day in the year, these spaces varying in size and form, as the particular bent or profession of the diarist may render necessary. Bound up with these diaries is a summary of the important events of the past year, a list of the acts of parliament passed during the previous session, an enumeration of public holidays, terms, &c., a great amount of valuable information regarding banking and insurance businesses, with a vast quantity of miscellaneous memoranda, so that the proprietor possesses in one book a diary and an almanac.

Diaries have often furnished the historian with invaluable material, supplying the absence of public records, and furnishing minute and graphic details of the social condition and of the secret springs of public events that are not to be looked for in more formal records. Perhaps the most notable in this respect are the diaries of Evelyn and Pepys.

**DIASCHI'SMA**, the Greek name of a small musical interval which only appears in the mathematical calculation of greater intervals. The diaschisma is, (1) the difference between the great half tone and the small *limma*, or the remainder when the latter is subtracted from the former, 2048 : 2025; (2) the difference between the *diesis* and the *syntonic comma*, also 2048 : 2025. The diaschisma and the small *limma* added together always make the greater half tone, or 16 : 15; and the *syntonic comma* added to the diaschisma always make the *diesis*, 128 : 125.

**DI'ASTASE** is a peculiar ferment developed during the germination of all seeds. An impure solution of diastase may be procured by adding one part of hot water to two parts of ground malt (see BEER), or freshly germinated barley, and, after standing for a short time, straining through a cloth. The proportion of diastase in malt is not more than 1 part in 500 parts, and yet it performs important functions. Thus diastase has a powerful action upon starch, and at a temperature of 150° Fahr. one part is considered powerful enough to change 2000 parts of starch into dextrine, and then into grape sugar. When obtained separately, diastase is a white tasteless substance. See GERMINATION.

**DIATHE'RMANOUS.** See HEAT.

**DIA'THESIS** (Gr. *dia*, through, and *tithēmi*, I place or arrange), a Greek word signifying a disposition or arrangement, and applied by the old medical authors to the predisposition or constitution of the body which renders it prone to certain diseased states. Thus the tubercular, scrofulous, gouty, rheumatic, cancerous, or calculous diatheses, are described as something different from the corresponding diseases, but leading to these as natural or probable consequences, under certain conditions or exciting causes. The study of diathesis apart from existing disease, however, is almost always unsatisfactory, and leads to over-refinement and the pursuit of intangible abstractions, without due regard to evidence; inasmuch as the existence of a state which *is not* disease, but *leads to* disease, can rarely be established upon an unassailable basis.

**DIATOMA'CEÆ**, or **DI'ATOMS**, a group of organised beings, now generally regarded as belonging to the vegetable kingdom, and ranked as a sub-order of *Algæ;* but formerly reckoned among animalcules, a view of their nature still entertained by some naturalists. Lindley makes D. an order of his *Algal Alliance* of thallogenous plants, including *Desmidieæ* (q. v.) as a sub-order, and distinguishing the true D. as another sub-order, under the name *Cymbelleæ.* The D. are generally of a brown colour, although they not unfrequently become greenish when dry. They are remarkable for their silicious covering, composed of two pieces or valves, and their angular shape, and are among the most beautiful and interesting of microscopic objects, exhibiting great variety of markings—striæ, dots, &c.—regularly and symmetrically arranged. The valves, or pieces of the silicious covering, are always equal in length, but their sides often differ much in breadth. All within appears to be only a single cell; but many of these cells are often united or in contact, according to some mode of arrangement characteristic of the particular species. D. are found both in salt and fresh water, also on the surface of damp rocks and walls, garden-paths, flower-pots, the glass of hothouses, &c. They may generally be obtained in great numbers by allowing water in which they exist to stand for a few hours, and then pouring off all except the more muddy or slimy part at the bottom. They may often be seen to move a little in the water or slime in which they exist, particularly those of most elongated form; and this was once regarded as a very conclusive evidence of their animal nature, but is now believed to be no more so than the movements of vegetable zoospores, and to be owing to their imbibing and emitting fluids in the processes of their vegetable life. They increase by division (whence the name diatomaceæ, Gr. 'through-cutting), which takes place not transversely but longitudinally; and the lines which mark its progress are almost always visible in them. In this process, new silicious valves are formed along the line of division, the old valves remaining on the outer sides, and each new diatom cell having an old valve and a new one. True reproduction takes place by Conjugation (q. v.), and by the formation of *Sporangia* (q. v.). D. very rapidly putrefy, but their silicious shields resist decomposition more perfectly than almost any product of organic nature, and are found in immense numbers in many marls, clays, and rocks. They are capable of resisting even the action of fire, and of the gastric-juice of the stomachs of animals, and are found in pumice and volcanic ashes, and in guano. The abundance of the D. as existing organisms, corresponds with what we infer from their remains in the oolite, chalk, &c., as to former geological periods. Britain is known to possess hundreds of existing species. Dr Hooker found them in such numbers in the Antarctic Ocean as to give an ochreous brown-colour to its surface as far as the eye could reach, and to the icebergs floating in it; whilst a submarine deposit is in process of formation, composed of their silicious shields. Thus these minute organisms, unimportant as they may be deemed individually, fill no insignificant place, collectively, in the general scheme of creation.

*Fossil D.* have been observed in strata of every age. Though so minute in the individual, they form, in the aggregate, considerable thicknesses of rock—they have, in fact, in common with the associated and nearly as minute and simple organisms of the animal kingdom, the Foraminifera, produced greater changes, and left more lasting records than any effected by higher members of either kingdom. In the older rocks, D. have not been noticed in any quantity, their existence, however, in the clay-slates of the Lower Silurians was discovered by Mr A. Bryson, and has been subsequently noticed by other observers. In Tertiary strata they occur in abundance. There is good reason for believing that the silicious substance of flint was obtained, to a large extent, from these organisms; many of their frustules may yet be discerned in it. Tripoli-stone consists entirely of their silicious plates, hence its value as a polishing agent. Several extensive deposits of tripoli are found in Bohemia—one at Egea is two miles in length, and averages 28 feet in thickness; another at Bilin, forming the upper layer of a hill, is 14 feet thick; it is composed chiefly of a species of *Gallionella*, with specimens of *Naviculæ*, &c., as many as forty-one thousand millions exist in every cubic inch of the stone! The city of Richmond, in Virginia, is built on a stratum of diatomaceous earth, 18 feet thick. Similar deposits are found in different localities in Britain, as at Premnay, Dolgelly, Lough Mourne, Raasay, and Mull. From the last locality, Gregory has given a catalogue of 150 species. The whitish powder of which the deposit consists is called in Sweden Bergmehl (q. v.), and is, in seasons of scarcity, mixed by the poor with their food, though probably without any advantage, save increasing its bulk. D. occur in more or less abundance in marl, peat, guano, estuary mud, and other recent deposits.

**DIATO'NIC**, a term used in the science of music, originally from the Greek, meaning 'by tones,' or 'from tone to tone.' The diatonic species of the ancient Greeks—apart from their chromatic and enharmonic species—formed the foundation of their whole system of music, and was arranged in tetrachords composed of one semitone and two whole tones. The diatonic scale of modern music is a combination of the Greek tetrachord, forming a succession of sounds progressing from degree to degree, by tones and semitones in a certain fixed order, neither omitting nor repeating; the position of the semitones varying, as the scale is major or minor.

**DI'ATRIBE** (Gr. *diatribê*, a disputation, or critical exercise) was a name originally given to a critical examination of a literary work, and at a later period to a bitter and violent criticism, either written or spoken, on any subject, in any department of literature.

**DIAZ**, BARTOLOMMEO, a Portuguese navigator of noble birth, who flourished during the latter half of the 15th century. His residence at the court of King John II. brought him into contact with many scientific men, among others the German cosmographer Behaim (q. v.). D. took a great interest in geographical discovery, and his knowledge and abilities were so highly estimated, that the king gave him the command of two vessels with a view to following up the discoveries already made by Portuguese adventurers on the west coast of Africa. D. soon reached the limit which had been attained in South Atlantic navigation, and first approached land in 26° south lat. After disembarking at various places, and taking possession of the shores in the name of the Portuguese king, he sailed round the southern extremity of Africa without suspecting it, and cast anchor at the mouth of the Great Fish River, a little to the east of Algoa Bay. A storm now rose, and drove him into Algoa Bay. He there found, near Port Elizabeth, his companion-vessel, from which he had been separated before rounding the Cape; but unfortunately the greater part of its crew had been murdered by the blacks. He now, for the first time, noticed his discovery, and called the cape, in remembrance of his danger, *Cabo de todos los tormentos* (Cape of all the Storms)—a name which the king of Portugal afterwards changed into its present, *Cabo de Buena Esperanza* (Cape of Good Hope). D. arrived in Lisbon December 1487, and was at first greeted with enthusiasm, but soon saw Vasco de Gama preferred before him, and was compelled to act under the latter in the grand expedition of 1497. Vasco de Gama even sent him back to Portugal after they had reached the Cape Verd Isles, so that he had no share in the honour of discovering a maritime route to the Indies. Three years after, he joined the expedition of Cabral, the discoverer of Brazil, but was lost in a storm, 29th May 1500.

**DIBBLE AND DIBBLING.** The common garden dibble is an implement too well known to require any lengthened description. A round piece of wood, about an inch and a half in diameter, sharpened at the point, is the most simple and common form. To allow it to be more easily pressed into the ground, a handle is usually added. This is all that is needed for a garden dibble. In some parts of England, where labour is plentiful, large breadths of wheat are put in with the dibble. Several dibbles are usually joined together, and made of sufficient length to enable a man to perform the operation, as he walks backwards, without much stooping. Children follow with the seed, and drop two or three grains of wheat in every hole. The dibbler is often used to put in beans. By dibbling, a considerable saving of seed is effected. From one bushel to six pecks of wheat is the usual quantity required to sow an acre. Dibbling is thought to be advantageous for light lands which are in good condition. More recently, several ingenious machines for dibbling have been constructed. The one most worthy of notice is Newberry's Horse-dibble, which sows from one to seven rows, and accomplishes the operation with great nicety and accuracy. Being an expensive machine, however, it has not come into general use. Dr Newington has invented a hand-dibble, a very perfect implement of its kind; the same machine makes the holes and deposits the seed at once. This has been a useful article on small holdings, and it is the greatest favourite at the present moment.

Dibbles of every kind are unsuitable for stiff or clayey soils; the soil, compressed and hardened around the hole which they make, not readily admitting the young fibres of the root, and retaining water to the injury of the young plant.

**DIBBS**, the English name of a game of great antiquity, played by boys and girls; and in Russia, as is described by Dr Clarke, it is played sometimes even by old men. It consists in throwing up the small joint-bones of the legs of sheep, and catching them first on the palm and then on the back of the hand. The antiquity of this simple kind of play is proved by figures on Grecian vases, on which females are seen kneeling and engaged in the sport. In Scotland, where the game is more usually played with small pebbles or shells, it is called 'the chucks.'

**DI'BDIN**, CHARLES, musician and poet, was born at Southampton in 1745, educated at Winchester, and at the early age of sixteen made his literary *début* in London, by writing an opera called *The Shepherd's Artifice*, which was produced at Covent Garden Theatre, of which he afterwards became musical manager. In 1789, he commenced giving a series of musical entertainments in the city, entitled *The Whim of the Moment*, which acquired a great celebrity. After several vicissitudes, he withdrew, in straitened circumstances, from public life in 1805, when government granted him, in consideration of his literary merits, a pension of £200. He died in 1814. D. is an admirable writer of sea-songs, of which he composed about 1200. Neptune, and not Apollo, seems to have inspired him. In fact, he is the only song-writer who has reached the heart of 'the mariners of England.' His verses smack of the briny deep, and reflect with astonishing felicity the easy, childlike virtues and the fearless courage of the English tar. It is known that they had a great effect during the war between France and England in supplying the navy with volunteers, and they have even been quoted in mutinies to the restoration of order and discipline. Among D.'s happiest pieces are *Poor Jack* and *Poor Tom Bowling*. The last edition of D.'s songs, with a memoir by T. Dibdin, illustrated by G. Cruikshank, appeared in 1850. D. also wrote a great number of dramatic pieces, &c.—He left two sons, CHARLES DIBDIN (died 1833), and THOMAS DIBDIN (died 1841), both of whom composed songs and dramas.

**DIBDIN**, REV. THOMAS FROGNALL, nephew of Charles Dibdin, the famous writer of sea-songs, was born at Calcutta in 1776. He lost both his parents when hardly four years of age, and was brought up by his mother's brother, a Mr Crompton. He studied at St John's College, Oxford, but left the university without taking a degree. After a short and unsuccessful career as a lawyer, he entered the church in 1804, and from that period until his death, 18th November 1847, continued to labour as a bibliographist with a diligence that would have been more commendable if it had been accompanied with a stronger judgment and a greater accuracy. D.'s principal works are an *Introduction to the Greek and Roman Classics* (1802), *Typographical Antiquities*, 4 vols. (1810—1819), *Bibliomania* (1811), *The Bibliographical Decameron* (1817), *Bibliotheca Spenceriana* (1814), *Bibliographical, Antiquarian, and Picturesque Tour in France and Germany* (1821), *The Library Companion* (1824), and *Reminiscences of a Literary Life* (1836). All D.'s books contain valuable and rare information, but are far from trustworthy in matters of detail. Many of them are exquisite in typography and artistic decoration.

**DICE** (plural of die), small cubes of bone or ivory, marked on their six sides with black dots, from one up to six in number. Two dice are employed in certain games of chance, such as backgammon; also in throwing for high stakes, or settling some dispute in which the decision is referred to the highest number thrown. In this latter point, the throwing of dice is equivalent to what is usually spoken of as 'casting lots.' The throwing of dice is in all cases effected by means of a small tubular box, which, held in the hand, is shaken at will by the player. When the dice are true cubes, there is no plan by which any kind of shaking can bring out a desired number. In order to repress gambling, and secure players against deception, the state, by the Act 9 Geo. IV. c. 18, imposes a duty of 20*s*. on each pair of properly made dice, which are accordingly stamped, and inflicts a penalty on the sale of those issued without this mark of authority. Nevertheless, we believe there is a pretty free sale of unstamped dice, under the cant name of 'bones,' at an insignificant price. Unscrupulous gamblers, as is well known, resort to the odious practice of loading dice, by plugging them with lead on a particular side, that the higher numbers are almost certain to be turned up. Where there is any suspicion of this trick, the thrower should be requested to turn down the mouth of the box abruptly, to prevent the dice from rolling, and improperly adjusting themselves. See GAMBLING.

**DICHLAMY'DEOUS** (Gr. *dis*, twice, and *chlamys*, a covering), a term in botany, applied to those flowers which have both a calyx and a corolla. Flowers in which the calyx and corolla are very similar, and unite to form a *perianth*, are dichlamydeous, as well as those in which they are very different.—In the system of Decandolle, dicotyledonous or exogenous plants are divided into *Dichlamydeous* and *Monochlamydeous*, the former including the three sub-classes of *Thalamifloræ*, *Calycifloræ*, and *Corollifloræ*, whilst the latter form a single sub-class.

**DICHO'TOMOUS** (Gr. divided into two equal parts), a term often used in botanical description to designate branching by repeated forkings. The veins of the fronds of ferns and of the leaves of some coniferous-trees, the stems of some ferns, the fronds of some algæ, and the stems of a few phanerogamous plants, are dichotomously branched. The stem of the mistletoe is generally divided in this manner, and it is a remarkable characteristic of that of the doom palm.

**DICK**, THOMAS, LL.D., a well-known religious philosopher, was born in 1774, near Dundee, Scotland, educated at the university of Edinburgh, and intended for the ministry in connection with the Secession Church. After a brief pastoral charge, however, he devoted himself to teaching, lecturing, occasional preaching, and authorship. D. proved himself to be a truly useful writer; but although his productions obtained a great popularity both in England and America, they brought him very little pecuniary return. Towards the close of his life, a small pension was granted him in consideration of his literary services. He died at Broughty Ferry, near Dundee, 29th July 1857, in the 83d year of his age. D.'s principal works are

—*The Christian Philosopher* (1823), *The Philosophy of Religion* (1825), *The Philosophy of a Future State* (1828), *Celestial Scenery* (1838), *The Sidereal Heavens* (1840), and *The Practical Astronomer* (1845). Several of D.'s writings have been translated into other languages; one, even into Chinese.

**DICK BEQUE'ST**, the name given to a fund bequeathed by James Dick of Finsbury Square, London, for the benefit of the parochial schoolmasters of Moray, Banff, and Aberdeen. Mr Dick was born at Forres, Morayshire, in November 1743. Having entered mercantile life in the West Indies at the age of 19, he amassed a considerable fortune, which he subsequently increased in London. He died on the 24th May 1828, leaving the chief part of his fortune for the purpose above mentioned. The sum bequeathed amounted in 1833 to £113,147, 4*s.* 7*d.*, since increased to £122,000. These funds, being invested in heritable securities, yield (after deducting all expenses) for annual distribution a sum which amounts, on an average, to £4000. Mr Dick's object was 'to encourage active schoolmasters, and gradually to elevate the literary character of the parochial schoolmasters and schools.' Acting on this declaration of the testator's wish, the trustees in whom the administration became vested* ordained first, that with a view to raise the literary character of the schoolmasters, none should, after a certain date, participate in the bequest who had not passed, to the satisfaction of examiners appointed by them, an examination in the English language and literature, geography, arithmetic, geometry and trigonometry, algebra to quadratic equations inclusive, Latin, Greek, history, and chronology. To these branches have lately been added an examination in the art of teaching and in physics. To those who highly distinguish themselves in these examinations, a sum of money is awarded by the trustees, and they are entitled to a small allowance during their term of office. Further, with a view to raise the literary character of the schools, and to encourage *active* schoolmasters, the trustees appointed a Visitor, who should report annually to them on the condition of the schools, making a round of all those schools, whose teachers claim participation, once in three years—now, once in two years.

In allocating the fund at their disposal, the trustees take into consideration the number of scholars attending each school, the branches taught, the fees paid, and the salary fixed by the heritors. Each of these elements has attached to it a certain value, the object of this being to make it the interest of teachers, heritors, and ministers to promote the education of the parish. The sum to which a teacher may be entitled in consequence of the position he holds on the books of the trustees in the above respects, is allowed, increased, restricted, or refused, according to the report of the visitor on the condition of the school. The highest sum paid to any teacher in 1860 was £44, 16*s.*; the smallest, £20, 14*s.* 10*d.*; the average, £30, 2*s.* A considerable number of teachers do not participate in consequence of their having failed to comply with the conditions of the trustees.

There can be no doubt that the operation of this bequest has been most advantageous. There is no district in Scotland in which the parochial schools are so uniformly taught by highly qualified men—all being graduates, and very many licentiates of the church. The results of the teaching, taking into consideration both the number of subjects taught and the actual acquirements of the pupils, it would not be easy to equal anywhere.

**DI'CKENS**, CHARLES, novelist and humorist, was born at Landport, in Hampshire, in February 1812. His father, Mr John Dickens, was employed for some years in the Navy Pay Department, but at the conclusion of the war with France was pensioned, and became a parliamentary reporter. In this pursuit his son was soon distinguished for uncommon ability; and after a literary engagement—at a very early age—upon *The True Sun*, he attached himself to the staff of the *Morning Chronicle*. In this newspaper he gave the first evidence of his talents in the lively essays, entitled *Sketches by Boz*, published in 1836. Encouraged by their success, he undertook to write the letterpress of the *Adventures of Mr Pickwick*, the illustrations of which were to be executed by the then more famous Mr Seymour, a comic draughtsman. The result was as though Shakspeare had been engaged to write the libretto for an opera of Mr Balfe's. The *Pickwick Papers*, which had an enormous commercial success, commenced also an era in English literature. It was the first of a series of fictitious works exhibiting the life and manners of the middle and lower classes, which up to that time had had scarcely any exponent. In one respect, however, this book had neither predecessor nor progeny. Neither before nor since has there ever been such a literary embodiment of healthy animal spirits. There is none like it for unflagging but never unwise merriment—for humour that is very much the reverse of dry. That Mr D. has given us no more *Pickwick Papers* is to be lamented, but may be easily explained by the fact, that he has never had the advantage of being five-and-twenty again. Since then, however, he has given us many works more admirable in other respects. *Nicholas Nickleby*, his next effort, was, as a story, greatly in advance of it. It was also the first of those social novels which form so marked a feature in modern literature. It was aimed at the wrongs and cruelties inflicted upon their wretched pupils by the cheap schoolmasters of Yorkshire—and it hit its mark. Since then our author has set lance in rest against many a social monster. He may be sometimes wrong, but he can scarcely be accused of want of honesty of purpose; while quite as little can partisanship (except that he is always for the poor) be laid to his charge, since at the very time that the country gentlemen were shaking their heads at him for his want of reverence for 'land,' he incensed the manufacturing interest by the publication of *Hard Times*. His sarcasm is of a rather peculiar character; too good-natured to sneer, and with eyes, notwithstanding their indignant fire, that never lose sight of the ludicrous side of things, his style is mocking argument. After *Nicholas Nickleby* came *Master Humphrey's Clock*, containing the *Old Curiosity Shop* and *Barnaby Rudge*. In the former of these, and in the character of Little Nelly, he first exhibited that power of setting forth child-life and child-thought which may have been said perhaps, before the publication of George Eliot's works, to be peculiarly his own. *Barnaby Rudge* was his first, and, with the exception of his subsequent *Tale of Two Cities*, his only attempt to describe the past; and it was a successful one. It is probably, with reference to plot and circumstance, his best novel, barring *David Copperfield*. The *Old Curiosity Shop* began in a curious dreamy manner, which, although obviously a favourite one with our author, he soon perceived was unappreciated, and had the prudence to discontinue. This disposition of his mind towards the weird and the grotesque he subsequently developed with greater success in his *Christmas Stories.* After a voyage across the Atlantic, Mr D. published in 1842 his *American Notes for General Circulation;* but a much more admirable result of that expedition appeared in his *Martin Chuzzlewit.* This was certainly the greatest of his humorous works since the *Pickwick Papers,* and it may almost be said to have been his last. From this period, his animal spirits—a rare gift among even comic authors, and rarely lasting so long as in his own case—appear to have deserted him. His humour, except in some rich creations, such as Mr Micawber, is no longer so apparent, while, on the other hand, his wit and pathos have increased. *Dombey and Son* was considered a falling off in one who stood so high; but his death of little Dombey brought tears to the eyes of lawyers. When men were expecting that he should wane and weaken like other prolific writers before him, he produced a novel as fresh as the dawn. In this, he, for the first time, adopted the autobiographical form, and that perhaps offered him some advantages; but at all events, the result was admirable. *David Copperfield* is, in our judgment, by far his greatest work, and will endure—though for very different reasons—as long as the *Pickwick Papers.* Its Agnes is perhaps the most charming female character in the whole range of fiction. *Bleak House, Hard Times, Little Dorritt,* the *Tale of Two Cities,* and *Great Expectations,* have since succeeded one another with almost periodical punctuality, and an audience larger than any English author ever had has awaited each. No prose-writer was ever more quotable or more quoted than he. Sam Weller's metaphors, Mr Squeers's educational methods, Mrs Gamp's assertions, corroborated by her unreal friend Mrs Harris, and Mr Micawber's moral and commercial reflections, are in the mouths of all men; while he supplies the newspapers, even when most hostile to himself, with their best epithets for social abuses and political mismanagement. In 1845, the *Daily News* was started under our author's editorial auspices, but the task appears to have been ungenial, for he soon withdrew from it. In 1850, he commenced a weekly periodical, entitled *Household Words,* which has since been merged into *All the Year Round,* and enjoys a large circulation.

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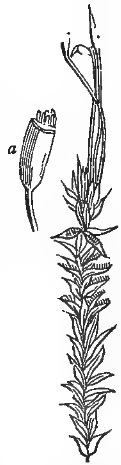
* The Keeper and Deputy-keeper of the Signet (Edinburgh), the Treasurer of the Society of Writers to the Signet, and eight Commissioners chosen by and from among the Commissioners of the Signet.

**DICLINOUS** (Gr. *dis,* twice, and *klinē,* a bed), a term in botany, signifying that flowers are unisexual, having stamens only, or pistils only, and opposed to *monoclinous* or *hermaphrodite.* It is much used by some botanical authors.

**DICOTYLE'DONOUS PLANTS** are those of which the embryo is ordinarily furnished with two seed-lobes or cotyledons (q. v.) opposite to one another, or with more than two, which in that case are verticillate. In general there are only two cotyledons; a greater number being of rare occurrence, but being found in some of the *Coniferæ,* as Spruce Fir, Larch, &c., in *Ceratophyllum,* &c. It is not, however, always quite easy to determine whether a plant belongs to the class of Dicotyledonous Plants or to that of Monocotyledonous Plants (q. v.), as sometimes, in the former, only a single cotyledon presents itself, which is the case with a number of species of the sub-genus *Bulbocapnos* in the genus *Corydalis;* or the cotyledons are altogether wanting, as in Dodder (*Cuscuta*), or the embryo is in so rudimentary a state in the seed, that it at first consists only of a pair of cells as in *Monotropa.* The habit of the plants is therefore also to be taken into account, and particularly the structure of the stem and its mode of increase. The *radicle* of the embryo in dicotyledonous plants generally elongates itself by degrees until it forms the root of the plant itself; wherefore Richard designated these plants *Exorhizæ* (Gr. *exo,* outward, and *rhiza,* a root). The stem is exogenous (q. v.), and usually branched. The leaves have branching veins, and exhibit great variety of form. They are articulated to the stem. The calyx and corolla, when both present, are usually more distinct and dissimilar than in monocotyledonous plants.

**DICO'TYLES.** See PECCARY.

**DI'CRANUM,** a genus of mosses, having a single *peristome* of sixteen equidistant bifid teeth and the *calyptra* splitting up on one side (*dimidiate*). See MOSSES. The species are numerous, and some of them are among the most common British mosses, growing on the ground and on moist rocks. Many of them have elongated branching stems.



Dicranum (*Polysetum*): *a*, capsule, magnified, and with the calyptra removed, shewing the peristome.

**DICTA'TOR,** in the earliest times, was the name of the highest magistrate of the Latin Confederation, and in some of the Latin towns the title was continued long after these towns were subjected to the dominion of Rome. In the Roman Republic the dictator was an extraordinary magistrate, irresponsible and endowed with absolute authority, whose original name was *magister populi.* The frequency of *crises,* or critical periods, in the quick, aggressive growth of the Roman state, necessitated such an office. The first dictator (T. Larcius or M. Valerius) was appointed 501 B. C., nine years after the expulsion of the Tarquins. According to Livy, the immediate cause of this dictatorship was a formidable war with the Latins. In general no one could be appointed dictator who had not been previously consul, and this condition was very rarely dispensed with. Niebuhr is of opinion that the dictator was originally created or elected by the curiæ, like the kings, but it is more probable that the senate passed a decree ordering one of the consuls to name or proclaim (*dicere*) a dictator. Originally, of course, the dictator was a patrician; the first plebeian who filled the office being C. Marcius Rutilus, 356 B. C., who was nominated by the plebeian consul M. Popillius Lænas. The dictatorship could not *lawfully* be held longer than six months, nor was it ever so, except in the cases of Sulla and Cæsar, which were altogether peculiar. It must not be supposed that during a dictatorship the functions of the other magistrates were positively suspended. The consuls and other regular authorities continued to discharge their proper duties, but in subordination to the direction and command of the dictator; being for the time simply his officers. The superiority of his power, when compared with that of the consuls, appears chiefly in these three points: he was far more independent of the senate; he had a more extensive power of punishment, without any appeal; and he could not be called to account after his abdication of the dictatorship for anything he had done during the period of his office. The *limits* of his power were as follows: he could not touch the treasury; he could not leave Italy; and he could not ride through Rome on horseback without previously obtaining the permission of the people. While the consuls had only 12 lictors, the dictator was preceded by 24, bearing the *secures* and *fasces*. To him also belonged the *sella curulis* and the *toga prætexta*. The last legally elected dictator was M. Junius Pera, who entered on his office 216 B.C. From this time *nominal* dictators were frequently appointed for the purpose of holding the elections, but even these finally disappeared, 202 B.C. Henceforth, in critical times, a sort of dictatorial power was conferred on the consuls by the senate by the well-known formula: 'That the consuls should see to it, that the state should receive no damage.' This practice rendered the appointment of *dictators* no longer necessary.

**DI'CTIONARY**, is merely the English form of *dictionarium*, a word not to be found in classical Latin, though of frequent use in that called monkish or medieval. A dictionary is, as every one knows, a book, but, in the widest sense of the word, its contents admit of no more strict definition than that they are arranged according to the order of the alphabet, and that every word within the scope professed to be embraced by the dictionary must have its proper place accordingly. It may be further said that the dictionary, in order to distinguish it from a mere list or index, must contain explanations or information about each word thus included within its scope, except in cases, of which many examples may be found in the present work, where it is sufficient to refer for a part or the whole of the account of one word to what is said under some other word. There are several other terms that are used synonymously, or nearly so, with Dictionary. The Greek word Lexicon is in common use for a dictionary of languages. It is not entirely so limited, however, in practice, as may be seen in such works as the *Lexicon Juridicum* of Calvinus or Kahl, which is just a dictionary of Roman and feudal law, of the same kind as Sir Edward Tomlin's *Law Dictionary* is of English law. The word Encyclopædia has generally a wider meaning; but there are often several books exactly of the same kind, of which some are called dictionaries, and others encyclopædias. Glossary and Vocabulary are nearly synonymous with a dictionary of a language; and the words Thesaurus, Catalogue, Directory, Gazetteer, and Index, are sometimes used as a title when Dictionary might be not inapplicable.

Dictionaries may be divided into two classes—(1) dictionaries whose object is to explain words and phrases; and (2) those that aim at giving information about things.

1. Dictionaries of language are, again, divided into various sub-classes or species. The most common kind—what, indeed, is understood by the term dictionary (and the equivalent Greek term *Lexicon*) when used by itself—is an alphabetical list of the words composing any language, either explained in the same language, or interpreted by the corresponding words of one or more other languages. To indicate that all, or nearly all, the words of the language are embraced, the name *Thesaurus* (Treasury) is sometimes used. *Special* Dictionaries contain only the words used by single authors, or classes of authors. A *Glossary* is a dictionary of unusual terms. An *Etymological* Dictionary is one in which the derivation of words is the sole or a prominent object.

2. Dictionaries of things (Ger. *Realwörterbücher*), or of information, are also of various kinds. When the whole field of human knowledge is embraced, we have an Alphabetical Encyclopædia. The name Encyclopædia or Cyclopædia is sometimes given to dictionaries of special departments of knowledge, as the *Cyclopædia of Anatomy and Physiology*; but in all such cases, dictionary seems the correcter term. See ENCYCLOPÆDIA.

There is no kind of information, within wide or narrow bounds, that may not be thrown into the dictionary form. Dictionaries of apt quotations from the classics, the Scriptures, or the fathers, were much in vogue in the 17th century. There are dictionaries of biography, of geography, of dates, of architecture, of cookery, of political economy, of fortification—in fact, of every object of human knowledge and practice. As dictionaries of this class are of the same nature, except as to the restriction of their field, as Encyclopædias properly so called, we reserve some notice of the more important of them for that head.

Dictionaries of language, in our sense of the word, are of modern origin. The Greeks and Romans had no idea of a book embracing all the words of their own or any foreign tongue. Glossaries, however, of unusual words and phrases were early current. The earliest work of the kind extant (though much interpolated) is the Homeric Lexicon (Gr. *Lexeis Homerikai*, 'Homeric words') of Apollonius, an Alexandrine grammarian of the time of Augustus. More extensive compilations, such as the Lexicon of Suidas (q. v.), and the *Etymologicum Magnum* (q. v.), were made in the middle ages. A real dictionary became first possible after the invention of printing. A broad and sure basis for Greek lexicography was laid by Henry Stephens (q. v.) in his *Thesaurus* (1572); the Latin *Thesaurus* of Robert Stephens, which did the same for Latin, had appeared in 1531. Previously to the discovery of printing, and for some time after, the explanations of Latin words were given in Latin. 'The earliest *printed* vocabulary with which we are acquainted in which the words of any modern language answering to the Latin are inserted, is the *Promptorius Puerorum*, published by Pynson in 1499, in which English words are followed by their supposed Latin equivalents' (*Quarterly Review*, September 1855). Some of the more important dictionaries will be noticed under the heads of the several languages.

**DI'CTUM DE KE'NILWORTH** was an edict or award between King Henry III. and all those barons and others who had been in arms against him, and so called because it was made at Kenilworth Castle, An. 5 Henry III., containing a composition of five years' rent for the lands and estates of those who had forfeited them in the rebellion.—*Cowel's Interpreter.*

**DICTY'OGENS**, in Botany, a class established by Lindley for the reception of a comparatively small number of natural orders, genera, and species, usually included by other botanists among *Endogens* or ENDOGENOUS PLANTS (q. v.), but which, whilst they agree with endogens in the structure of the embryo, differ from them in the stem and leaves. The annual branches or aërial stems have indeed the endogenous structure, but the rhizomes or subterranean stems more resemble the structure of exogenous plants (q. v.), with pith, medullary rays, and wedge-like vascular bundles. The leaves are broad and net-veined, usually disarticulating with the stem. The most important natural orders referred by Lindley to this class are *Dioscoreaceæ* and *Smilaceæ*, and the most important plants belonging to it are the different species of Yam and Sarsaparilla.

**DICY'NODON**, the name given by Owen to a genus of fossil reptiles, whose remains have been found in South Africa. The true age of the rock in which they occur has not been ascertained; the accompanying organisms seem to indicate that it is Triassic. Few bones of these animals, save those of the skull, have been sent to this country. A complete restoration of one would be a most valuable addition, not only to palæontology, but to systematic zoology as well; for the numerous skulls that have been examined, have been sufficient to shew that this is one of those anomalous forms which unite in their structure the characteristics of widely different animals. It has affinities with the crocodile, the lizard, and the tortoise, though perhaps the completely closed orbits and the sharp compressed jaws ally it more closely to the last-named animal. Its lower jaw also is covered with a horny plate, as in the tortoise. The most remarkable peculiarity is the existence of a pair of large sharp-pointed tusks, one from each side of the upper jaw, growing downwards as in the mammalian morse or walrus. The generic name, meaning 'two canine teeth,' has been given to them from these singular tusks, which are peculiar to this genus. The articulating surfaces of the vertebræ are both hollow—a fish-like peculiarity, from which it might be argued that these reptiles were good swimmers; probably they lived constantly in the water, but the construction of the bony passages of the nostrils proves that they must have come to the surface to breathe air. Four species have been discovered.

**DIDA'CTIC PO'ETRY**, that kind of poetry which aims, or seems to aim, at instruction as its object, making pleasure entirely subservient to this. It has been disputed whether or not the existence of a kind of poetry especially entitled to the name didactic, consists with the very nature and object of the poetic art. For it is held that, to point out instruction as the peculiar object of one kind of poetry, is to overlook the high aim of all poetry; and that a poem may be in the highest sense didactic, which yet is epic, dramatic, or lyric in its form; and the Book of Job, the Psalms, and other poems contained in the Sacred Scriptures, are quoted as examples. In the poems generally called didactic, the information or instruction given in verse is accompanied with poetic reflections, illustrations, episodes, &c. The *Georgics* of Virgil have been the model according to which didactic poems have very generally been composed; and the literature of all European nations contains many productions of this kind; whilst no subject is so unpromising that it has not found some one to select it as a poetic theme.

**DIDE'LPHYS.** See OPOSSUM.

**DIDEROT, DENIS**, a celebrated French encyclopedist and philosophical writer, was born at Langres, in Champagne, 5th October 1713. He was educated for the church at the college of his native town, and subsequently at that of D'Harcourt, Paris; but disliking the clerical office, and after having made a trial of law, a profession which he also found uncongenial, he finally resolved, after various vicissitudes, upon becoming a *littérateur*. For some years, however, his mode of life was very precarious. On one occasion, being reduced to the greatest extremities, he seriously resolved that if the world should ever prosper with him, he, not ignorant of misfortune, would never disregard the applications of the indigent. This resolution was religiously kept; for after having attained a position of comparative affluence, he was continually surrounded by applicants desirous of obtaining assistance, which, whether in the shape of money or instruction, D. was always willing to afford them. Although very poor, D. married in 1743. Necessity now drove him to increased exertions. He translated the *History of Greece* from the English of Stanyan, receiving for this work the sum of 100 crowns. Soon afterwards followed the *Essai sur le Merite et la Vertu;* the *Pensées Philosophiques*, written, it is said, in the space of four days; and the *Interprétation de la Nature*. Shortly after appeared his *Lettre sur les Aveugles*, for the writing of which he was confined three months in the prison of Vincennes. Believing that it was, among other things, his vocation to regenerate the theatre, he produced a melodrama (1758), entitled *Le Père de Famille*. It was unsuccessful, and was followed by others equally so, so that it was said, 'Le Père de Famille a été le père d'une famille déplorable.'

But D.'s great work was the *Encyclopédie*, of which he and D'Alembert were the joint-editors. It was commenced in 1749. D., besides revising all the articles, wrote the departments of history, of ancient philosophy, and of the mechanical arts. He also wrote art criticisms from 1765 to 1767, shewing a readiness in interpreting the meaning of a picture, and a power in reproducing it vividly in words, unequalled by any writer of his time. Towards the latter portion of his life, D., who had never been able to save any money, determined to sell his library, to provide for his only daughter. The Empress Catherine of Russia, having been informed by her French ambassador of his intention, bought the library, on condition that D. himself should be librarian, and undertake the care of it at a salary of 1000 francs yearly. In 1773, he set out for St Petersburg to thank his imperial benefactress, returning in the following year. But his health, which was impaired by this journey, soon after gave way, and he died on the 30th July 1784.

D. had worked at the Encyclopædia for the space of about 30 years. His fitness, natural and acquired, for this species of literary labour was complete. With the advantage of an excellent education, he had a great love of truth, and a curiosity to ascertain the real relations of any subject upon which he was engaged. He was distinguished by a swiftness and dexterity of intellect, that enabled him to catch the salient points of his topic, and to present them in the best light. As regards religion, D. was an atheist, sincere even to fanaticism in his opinions, and anxious to indoctrinate his countrymen with his own scepticism. The *Encyclopédie* became a vehicle for the indirect propagation of his views. One of the last recorded sayings of D. is very characteristic: 'The first step towards philosophy is incredulity;' but unfortunately D. thought it was also the last. His two most powerful tales are *Jaques le Fataliste* and *Le Neveu de Rameau*—both published after his death. The second was translated into German by Goethe.

**DI'DO, or ELI'SSA**, according to the legend, the foundress of Carthage, was the daughter of a king of Tyre, called by some Agenor or Belus, by others Mutgo or Matgenus. His successor, Pygmalion, the brother of D., murdered her husband and uncle, a priest of Hercules named Acerbas; by Virgil, Sichaeus. With the treasures of Sichaeus, which Pygmalion had sought for in vain, and accompanied by many Tyrians, D. escaped to sea. She landed in Africa, not far from the Phœnician colony of Utica, and built a citadel called Byrsa (from Gr. *Bursa*, the hide of a bull), on a piece of ground which she had bought from the Numidian king Hiarbas. The meaning of the word Byrsa, gave rise to the legend that D. purchased as much land as could be encompassed with a bullock's hide. After the agreement she cut the hide into small thongs, and thus enclosed a large piece of territory. Here she built the city of Carthage. To avoid being compelled to marry Hiarbas, she stabbed herself on a funeral pile, which she had caused to be erected, and after her death was honoured as a deity by her subjects. Virgil ascribes the death of D. to her unrequited passion for Aeneas; but many of the ancient writers conceived that the poet had committed an anachronism in making her contemporary with the Trojan prince. The more general opinion was, that D. had built Carthage somewhere between 50 and 100 years before the foundation of Rome.

**DIDOT**, the name of a celebrated family of French printers and publishers.

D., François, the first of the family that attained eminence, was born in 1689, and died in 1757. His principal professional achievement was the publication of the *Voyages* of his friend the Abbé Prévost, a work in 20 volumes, perfect as regards the text, and enriched with a great number of engravings and geographical maps. D. had eleven children, of whom two—François Ambroise D. (born 1730, died 1804) and Pierre François D. (born 1732, died 1795)—acquired considerable distinction as printers. Henri D. (born 1765, died 1852), eldest son of Pierre François, made himself famous as an engraver, letter-founder, and mechanician. He was 66 years old when he engraved, for his well-known 'microscopic' editions of eminent authors, those characters which are the *ne plus ultra* of typographical art. A daughter of the third son of Pierre François married Bernardin de Saint-Pierre, who was for some time associated with the Didots in their paper manufactory of Essonne; and in his country-house near this place wrote his *Paul et Virginie.* Pierre D., eldest son of François Ambroise (born 1760, died 1853), still further increased the fame of the family. His Louvre editions of *Virgile*, *Horace*, *Racine*, and *La Fontaine* are magnificent. At the Exhibition of the Products of Industry in 1801, a jury declared his *Racine* to be 'la plus parfaite production typographique de tous les âges.' Besides a great number of works, not less remarkable for their typographical perfection than for their literary value, such as the *Voyages de Denon*, D. published a collection of the French *chefs-d'œuvre*, dedicated *Aux amis de l'Art Typographique.* D. was also an able *littérateur.*

D., Firmin, brother of the preceding, and son of François Ambroise D., was born at Paris in 1764. As a printer, and especially as an engraver and founder, he raised the family name to the pinnacle of professional eminence. The absolutely perfect Roman characters, used in the Louvre editions printed by his elder brother, were engraved and cast by him. Firmin D. applied the stereotyping process to the Logarithmic Tables of Callet, a work that required to be executed with the most rigorous accuracy, and which, through this means, is perfectly free from error or blemish. The whole of the French, as well as most of the Italian and English classics, were published by him according to the same process. These stereotypic editions (the word *stereotypic* was invented by Firmin D.) were wonderfully correct and cheap; *Virgile* is without a blemish, is ornamented with vignettes, and was sold for 15 sous (7½*d.*); it was a kind of revolution in the book-trade of France. The most distinguished foreigners were accustomed to visit D.'s establishment as one of the great sights of Paris. The Emperor Alexander, when in Paris in 1814, minutely examined every department of it; and placed under D. two young Russians, to be instructed in all the branches of typography. Some of the most celebrated continental printers served their apprenticeship with him. In 1827, Firmin D. retired from business, to devote himself wholly to his duties as *député.* A sage friend of freedom, he attached himself to the moderate and constitutional opposition, headed by Royer Collard. D. also obtained considerable reputation as an author by his tragedies, *La Reine de Portugal* and *La Mort d'Annibal*, and several volumes of metrical translations from the classics. He died 24th April 1836.

D., Ambroise Firmin, and Hyacinthe, sons of the preceding, the first, born 20th December 1790, the second, 11th March 1794, now carry on the family business (aided by their sons, Paul and Alfred D.), under the firm of Firmin Didot, Frères. In their hands it still retains its magnitude and importance.

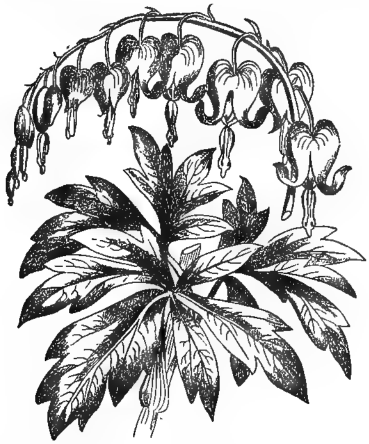
**DIDY'MIUM** is a very rare metal found in the minerals Cerite, Allanite, &c.

**DIÉ**, St, a town of France, in the department of Vosges, is situated on the Meurthe, 25 miles north-east of Epinal. It is handsomely built; its streets clean and regular. D. is also the seat of a bishop, has an old cathedral church, and various important educational institutions. It has manufactures of cotton goods, with some trade in corn, cattle, flax, hemp, paper, ironmongery, &c. There are copper and iron mines, ironworks, and marble quarries in the neighbourhood. Pop. 6730.

**DIEFFENBACH**, Joh. Fried., a celebrated surgeon of recent times, was born in Köningsberg, in Prussia, in 1792. He had begun the study of theology when the war of liberation broke out, in which he took part as a volunteer. In 1816, he exchanged the study of theology for that of medicine, and especially surgery. After studying at Bonn and elsewhere, and travelling in France, he took his degree in 1822, and commenced practice in Berlin, where he soon attained distinction as an operator, and in 1840 was promoted to be professor and director of clinical surgery. He died in 1847. Besides eminent skill in all the usual operations with the knife, D. introduced many improvements, particularly in the art of forming new noses, lips, eyelids, and the like, as well as in cutting the muscles for squinting and stammering. Of his writings, we may mention *Die Transfusion des Bluts und der Einspritzung der Arzneien in die Adern* (Berl. 1828); *Uber die Durchschneidung der Sehnen and Muskeln* (Berl. 1841); *Die Heilung des Stotterns* (Berl. 1841); *Die Operative Chirurgie* (12 vols., Leip. 1844—1848), his chief work, which has been translated into several languages.

**DIE'GO**, San, the best harbour in Upper or American California, next to that of San Francisco, is in lat. 32° 45′ N., and long. 117° 8′ W. It is 6 miles long, and varies in breadth from 1 to 2; and it is 6 or 7 fathoms deep, even to the shore. There are two towns on the bay, distinguished as *Old* and *New*, of the same name—the former being Spanish and the other Anglo-Saxon. The trade of the place is considerable, the foreign arrivals in 1851—1852 having been 29 vessels, of 19,016 tons. The soil around is fertile, and the staple productions are barley, maize, wheat, sheep, cattle, and horses.

**DIELY'TRA**, a genus of plants of the natural order *Fumariaceæ*, in appearance and habit much resembling fumitories of extraordinary size. *D. spectabilis*, a native of Siberia and the northern provinces of China, was introduced into Britain from the island of Chusan in 1846, and rapidly became a general favourite, on account of its long racemes of drooping, delicate, rosy-pink flowers. It is now to be seen not only in green-houses, but, as commonly as almost any flower, in cottage-windows, and even in cottage-gardens, although in the northern parts of Britain it seldom attains its full luxuriance in the open air. It is one of the favourite plants of the Chinese.



Dielytra Spectabilis.

**DIEPENBECK**, Abraham van, a distinguished Flemish painter, was born probably in 1607, at Herzogenbusch (Bois-le-Duc), and at first confined himself to painting on glass, in which he acquired the reputation of being the first of his time; but having conceived a disgust for this kind of painting, on account of the cracking of the glass, which he could in no way prevent, he abandoned it, and became a pupil of Rubens. He then went to Rome, and on his return to Belgium became a sort of assistant to his master. In 1641, he was elected President of the Antwerp Academy, an honour which he retained till his death, in 1675. D. painted much, and with wonderful facility, on tapestry and wainscotting. He certainly imitated Rubens, but with great freedom and force of colouring. His works consist, for the most part, of designs for title-pages, theses, devotional subjects, and the decoration of books. They exhibit great fertility and liveliness of genius, but are in general hurriedly and imperfectly finished. His master-piece in this way is the *Tableaux du Temple des Muses* (Paris, 1655), a series of designs, 59 in number, engraved by the best artists of the time—Bloemart, Maltram, &c. Those of Bellerophon, Orpheus, the Dioscuri, Leander, &c., have been pronounced unsurpassed. His oil-paintings on canvas are few, but the churches of Antwerp have many windows painted by him. D. resided in England for some time during the reign of Charles I., and painted several landscapes and animals for William Cavendish, Duke of Newcastle.

**DIEPPE**, a seaport town of France, in the department of Seine-Inférieure, at the mouth of the river Arques, on the English Channel, lat. 49° 55′, long. 1° 5′ E. D. is situated between two high ranges of chalk cliffs, is regularly built, with tolerably wide clean streets running parallel to the sea; and the houses—built for the most part of stone and brick, with high slanting roofs—have a picturesque appearance. It is walled, has a castle occupying a high cliff at the west end of the town, which it commands, as well as the harbour, which is situated to the north-east, and admits vessels of 500 tons burden. West of the old castle lies the little fishing suburb of Pollet, far from beautiful in appearance, but exceedingly interesting from the fact that the inhabitants differ in language, manners, and costume from the rest of Upper Normandy, and are supposed to be descendants of those Saxons who settled on the French coast during the period of the Merovingian kings. Some interesting historical associations attach to the castle of Dieppe. Here Henry IV.—the people of D. having been the first to acknowledge his right to the throne of France—retired before the forces of the League, previous to the decisive battle of Arques, fought within four miles of D.; and here the Duchess of Longueville, so noted as a leader of the party of the Fronde, sought refuge for a time from the royal power she had defied. The castle is now occupied as a barrack. The other principal buildings are the churches of St Jacques and St Remi, the theatre, and a bathing establishment. The town has several squares, and is adorned by nearly 70 fountains, which derive their supply of water from an aqueduct about three miles long. D., being one of the principal watering-places of France, has a great accession of visitors during the summer months; and a large number of huts for the accommodation of bathers, bathing-machines being dispensed with, line the shores. The manufactures are lace, fine linen, and paper; and the carved articles of horn, bone, and ivory have long been famous. There are also ship-building yards, sugar-refineries, rope-walks, and distilleries; and the fisheries—both coast and Newfoundland—are important, almost the whole of the population of the suburb of Pollet being engaged in them. D. is a favourite landing-place of English tourists visiting France. Pop. 17,806. The rise of Havre has greatly injured the trade of Dieppe.

**DIE′-SINKING**, the art of engraving the die or stamp used for striking the impression on coins, &c., and for stamping thin plates of metal into various devices.

The importance of die-sinking has much increased of late on account of the great extension of the process of stamping thin metal. Many kinds of work formerly bent into shape by the hammer and punch, are now struck by a few blows between suitable dies. As examples of these, we may mention the ornamental work of gas-fittings, window-curtain cornices, common jewellery, ornamental trays, dishes, boxes, &c. For such purposes, a pair of dies is required, one in relief, the other in intaglio, and the metal is pressed between them. Not only are ornamental articles stamped in this manner, but useful articles, composed of many parts, are made entirely by cutters and dies, each part being cut and stamped by a pair of dies, and then the parts united by another pair, the junction being effected by overlaps, which the uniting dies press into their places. See Buttons. The astonishing cheapness of many of the Birmingham products is mainly due to the use of dies for doing by a single blow the work that formerly required long and tedious manipulation. For further information on this, see Stamping.

The most ancient and familiar application of dies, is in the striking of coins and medals; the method of sinking the dies used for this purpose will serve to illustrate the general method of die-sinking. Suppose the coin to be of the size of a shilling: a cylindrical piece of steel, about three or four inches in length, and two in diameter, is prepared by slightly rounding one end of the cylinder, then turning and smoothing upon the middle of this a flat face equal to the size of the coin. This blank die, which is carefully softened, is then engraved with the device of the coin in intaglio. This is a very delicate and artistic process, and is effected by a great number of careful touches with small and very hard steel tools. The face of the die is now hardened by placing it face downwards in a crucible upon a layer of bone-dust, or a mixture of charcoal and oil. In this position it is raised to a cherry-red heat, then taken out, and plunged in water. When properly tempered, it is in a state to be used for stamping the coin; but dies of superior workmanship, from which many impressions are required, are not thus directly used, as the expense of engraving is very great, and the risk of breakage considerable. This first engraved die, called the matrix, is therefore reserved only for making other dies. An impression in relief is made from this matrix on a small block of soft steel, which is called the puncheon; this is retouched and hardened, and from it the dies directly used for striking the coins or medals are impressed.

When the engraving is not very costly, a small number of impressions required, or a soft metal is to be stamped, as in livery buttons, for example, the work is stamped directly from the engraved die or matrix. When the device is in high relief, and the metal is hard, many heavy blows are required. Some of the finest large bronze medals require two or three hundred blows for each impression, and the medal has to be annealed by heating between every two or three blows. It is on this account that the difference between the price of pewter and bronze medals of the same subject is so great, the pewter being so much softer. Copper, though harder than pewter, is much softer than bronze, and hence the reader will easily understand why the device on the new bronze coinage, now in course of manufacture at the new mint of Birmingham, is in much lower relief than the old copper coinage, as it would not pay to use repeated blows and annealing in striking common coins. An impression in high relief or deep intaglio may be obtained by a single blow by the *cliché* method. For this, a fusible alloy is used, such as type-metal, or still better, an alloy of 2 parts bismuth, 1 lead, and 1 tin, which fuses at about 212°, and becomes pasty before solidifying. The metal is poured into a box or tray a little larger than the die, and when in a pasty condition, the die is placed over it, and struck smartly with a heavy mallet or a coining-press. A steel die is by no means necessary for this; sharp impressions may be obtained from bronze medals themselves, or even from wood and plaster casts. A cliché mould may be made in the first instance from the medal, and then a cliché relief from this mould, if the process is skilfully conducted. The skill required consists mainly in striking the blow with a force proportionate to the depth of the impression and the softness of the metal, and in selecting the right moment for doing so, just as the fused metal is on the point of solidifying; for, if too fluid, it will merely be driven aside; and if at all set, an imperfect impression results. The metal should be of about the consistence of melted sealing-wax, and then the surface is set by contact with the cool die or medal, while the body of the metal still yields to the pressure. Cliché moulds are admirably adapted for electro-depositing.

**DÏES IRÆ**, the name generally given (from the opening words) to the famous medieval hymn on the Last Judgment. On account of the solemn grandeur of the ideas which it brings before the mind, as well as the deep and trembling emotions it is fitted to excite, it soon found its way into the liturgy of the church. The authorship of the hymn has been ascribed to Gregory the Great, St Bernard of Clairvaux, Umbertus, and Frangipani, the last two of whom were noted as church-hymnists; but in all probability it proceeded from the pen of the Franciscan, Thomas of Celano, a native of the Abruzzi, in the kingdom of Naples, who died about the year 1255. When the church adopted it, and made it a portion of the service of the mass, cannot be ascertained with any exactness, but it must have been in any case before 1385. Several alterations were then made in the text; that, however, is believed to be the original which is engraved on a marble tablet in the church of St Francis at Mantua. Germany has produced many translations of the hymn, such as those of Schlegel, Fichte, and Bunsen. It was translated into English by Richard Crashaw in the 17th c., and by Lord Macaulay, Lord Lindsay, the Rev. Isaac Williams of Oxford, and others in our own day. Sir Walter Scott has introduced two or three of the opening verses into his *Lay of the Last Minstrel.* The following are the most effective stanzas of the original Latin:

Dies iræ, dies illa
Solvet sæclum in favilla,
Teste David cum Sibylla.

Tuba mirum spargens sonum
Per sepulcra regionum
Coget omnes ante thronum.

Mors stupebit et natura,
Quum resurget creatura
Judicanti responsura.

Liber scriptus proferetur,
In quo totum continetur
Unde mundus judicetur.

Judex ergo cum sedebit,
Quidquid latet apparebit,
Nil inultum remanebit.

Quid sum miser tunc dicturus,
Quem patronum rogaturus,
Quum vix justus sit securus?

Rex tremendæ majestatis,
Qui salvandos salvas gratis,
Salva me, fons pietatis.

Recordare, Jesu pie,
Quod sum causa tuæ viæ:
Ne me perdas illa die.

Quærens me sedisti lassus,
Redemisti cruce passus,
Tantus labor non sit cassus.

Qui Mariam absolvisti
Et latronem exaudisti,
Mihi quoque spem dedisti.

Inter oves locum præsta,
Et ab hœdis me sequestra,
Statuens in parte dextra.
Amen.

**DÏ'ESIS**, a term used by the ancient Greeks, in the division of musical intervals, of which they had three varieties. In modern music, the dïesis is understood to be the difference between the small and the great semitone, as from C to C sharp, and from C to D flat.

**DIEST**, a town of Belgium, in the province of South Brabant, on the river Demer, 17 miles north-east of Louvain. It is a walled town, and its fortifications have recently been so improved as to render it a place of great strength. D. has considerable manufactures of hosiery and woollen goods, but its chief products are beer—which is of excellent quality, and largely exported—and gin. Here a great horse-fair is held annually. D., which was once a feudal barony, under the dominion of the Princes of Orange, was taken by Marlborough in 1705. Pop. 7720.

**DÏ'ET.** Man and animals generally require that their food should be of such a nature as to compensate for the wear and tear of the tissues which is perpetually going on, and as at the same time to keep up the animal heat at its proper standard. Various classifications of the food of man have been at different times proposed, but those which have been most generally accepted are that of Dr Prout—in which the different kinds of food are grouped in definite chemical classes—and that of Liebig, which has reference solely to the ultimate destination of the food in the animal economy.

Dr Prout classifies all kinds of food under these heads: 1. The *aqueous;* 2. The *saccharine;* 3. The *oily* or *oleaginous;* and 4. The *albuminous;* to complete which, we ought to add 5. The *gelatinous*, and 6. The *saline*—whilst Liebig makes only two classes: 1. Those consisting of nitrogenised matters, which are adapted for the formation of blood, and which he terms the *plastic elements of nutrition;* and 2. The non-nitrogenised substances, which from their large amount of carbon, serve (as fuel) to keep up the animal heat, and which he names the *elements of respiration.* In place of the terms employed by Liebig, Dr R. D. Thomson has suggested *nutritive* and *calorifacient*, which are on the whole preferable. Although Liebig's view embraces a great general truth, there are numerous obvious exceptions to it; thus, for example, whole races of men preserve their health who live on animal food alone, containing no non-nitrogenous compound except a little fat; and when the flesh is dried in the sun, as is often the case, even the fat must melt away. We shall therefore adopt Prout's classification as the more practical of the two. It was based on the consideration, that the milk (the only *single* article of natural food that serves to support the animal body) is made up of substances which may be taken as representatives of his groups; for this, our earliest natural diet, contains water, sugar (representing his saccharine group), butter (representing his oleaginous group), caseine (a nitrogenous matter very similar to albumen, and representing his albuminous group), and salts; and recent researches have shewn that the yolk of the egg, which serves for the nourishment of the chick or other young animal before birth, similarly contains one or more representatives of the aqueous, saccharine, oleaginous, albuminous, and saline groups.

We shall now briefly consider these individual groups, and the uses to which the substances included in them are applied in the animal economy.

1. The *aqueous* group includes water and all the fluids which we use as drinks; and we must additionally bear in mind that all the varieties of animal and vegetable food which we term solids, in reality contain it, generally in great abundance; thus, for example, uncooked beef contains from 70 to 80 per cent., and some vegetables even a larger proportion of water. The uses of water are sufficiently obvious from the abundance in which it occurs in all the most important fluids of the body, as the blood, and the various digestive fluids. See DIGESTION, ORGANS AND PROCESS OF.

2. The *saccharine* group includes the different varieties of sugar, starch, gum, and cellulose, together with vinegar. This group is chemically characterised by all its members being included in the formula $C_aH_bO_b$; that is to say, they consist of carbon, together with hydrogen and oxygen in the proportions in which these elements form water. Hence (excepting vinegar) these substances have received the name of Carbo-hydrates.

Of the sugars, grape-sugar or glycose is the most important, partly from its frequent occurrence in ordinary articles of food, such as fruits of most kinds, honey, &c., and partly because it is the form of sugar into which starch (a most abundant ingredient in most kinds of vegetable food) is converted by the saliva, and pancreatic and intestinal juices, before it is fitted for absorption or any further changes. Since the sugars (which may thus be regarded as including starch) do not, in the normal condition, pass into the excretions, but are oxidised in the blood into carbonic acid and water, as ultimate products, they must contribute materially to the support of the animal heat. But they have other uses which we shall endeavour to explain, and which will, we trust, be intelligible if this article is read in conjunction with that on DIGESTION, to which we have already referred. Before becoming oxidised into their final products, they undergo various phases of less perfect oxidation, in which lactic, acetic, butyric, and other acids are evolved, of which the most important and abundant is lactic acid, which is found in considerable quantity in the small intestine, where it is doubtless of service in contributing to dissolve any nitrogenous matters which have escaped the action of the gastric-juice. Another use of these acids which are developed from the sugars is, that by acidifying the albuminous intestinal contents, they greatly increase their diffusibility through the intestinal membranes into the lacteals, and probably the capillaries. Here we probably have the clue to the therapeutic use of acids in various disorders of the chylopoietic viscera. Under certain conditions, the sugars are also converted into fat in the body.*

The remaining carbo-hydrates are of little or no value as food. There has been much difference of opinion as to whether gum can be taken up and applied to any definite uses in the organism; but the great mass of the most trustworthy observations seem to shew that it passes through the system unchanged. Independently of experiments on animals by Boussingault, Lehmann, and others, Dr Hammond (an American chemist and physician) found from experiments upon himself (1) that gum is altogether incapable of assimilation, and therefore possesses no calorifacient or nutritive power whatever, but is, on the contrary, a source of irritation to the digestive organs; and (2) that in consequence of the above fact, the solids of the urine during a purely gum-and-water diet are entirely derived from the waste of the tissues of the body, while the carbon exhaled (as carbonic acid) from the lungs is derived from the consumption of the fat.

Cellulose, or the substance of the vegetable cell, resists the action of the digestive fluids, and reappears unchanged in the fæces.

Vinegar is probably only of use indirectly in softening animal textures which are taken as food.

3. The *oleaginous* group includes all the fats and oils, whether derived from the animal or the vegetable kingdom. The members of this extensive group are composed of carbon (ranging from 60 to 80 per cent.) and hydrogen, with a little oxygen. Fat which has been taken with the food is mainly absorbed by the lacteals, although a portion of it passes directly into the capillaries of the villi, as has been shewn by microscopic examination, which has revealed the presence of fat-granules amongst the blood corpuscles. The modifications which are impressed upon the fats, in order to prepare them for absorption, are explained in the article DIGESTION. Their uses in the system are various. In their oxidation in the organism, whether the process be gradual or rapid, a large amount of heat is liberated;

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* The researches of Boussingault on milch-cows, of Milne Edwards and others on bees, and of Lacaze-Duthiers on the insects inhabiting galls, distinctly shew that starch and sugar are capable of being converted into fat in the animal organism.

and that they are oxidised, and for the most part ultimately resolved into carbonic acid and water, is evident, because they neither appear in any quantity in the excretions nor accumulate beyond a certain point in the organism. Moreover, in artificial, and doubtless in natural digestion, the presence of a little fat accelerates the solution of nitrogenous matters taken as food. Lastly, the occurrence of fat in milk, in the egg, in all plastic exudations, and in all highly cellular organs, is a clear indication that this substance plays an important part in the process of cell-formation; hence we may probably explain the therapeutic use of such medicines as cod-liver oil.

4. The *albuminous* group contains all those substances which are chemically known as the proteine-bodies (see PROTEINE), viz., albumen, fibrine, caseine, and the allied vegetable compounds, all of which are composed of very nearly the same proportions of carbon, hydrogen, nitrogen, and oxygen; while additionally they contain a little sulphur or phosphorus, or both: they all contain on an average about 15 per cent. of nitrogen, a substance which has not occurred in the preceding groups. All these proteine-bodies, such as occur in the fluids of the egg, in animal flesh, in the curdy matter of milk, &c., are dissolved by the gastric-juice and intestinal fluid, and converted into matters termed *peptones*, which although similar in their ultimate composition to the substances from which they are derived, differ from them in their greater solubility and their more ready diffusibility through animal membranes. Like the fats, they are chiefly absorbed by the lacteals, but to some extent by the capillaries. A reference to the chemical composition of the milk and of the fluids of the egg, shews that all the nitrogenous tissues in the body of the young animal must have been primarily derived from albumen or caseine; and it is established beyond all doubt, that these substances are throughout life the essential producers of blood, and consequently of the various nitrogenous structures which are built up from that fluid.

5. The *gelatinous* group (which formed a part of Prout's albuminous group) includes the different varieties of gluten, obtained by boiling, from many animal tissues; as, for example, bone-cartilage, tendons, skin, hoofs, &c. All soups and jellies which stiffen on cooling contain it, and such substances are popularly, but erroneously, regarded as highly nourishing. Unlike the preceding group, from which they only slightly differ in ultimate composition, they do not appear to form new blood, and their uses are still so questionable, that we will merely notice one function of them, which has been suggested by Liebig—viz., that these substances may go directly to the formation of such tissues as yield gluten on boiling, and which, if this food were not taken, would have to derive their nourishment from the members of the preceding group.

6. The *saline* group. With the exception of common salt (chloride of sodium), which we take instinctively in additional quantity with most kinds of food, the members of this group are unconsciously taken in the different articles of solid and fluid food on which we live. Want of space prevents us from noticing the different foods which yield the individual salts; but when we invariably find phosphate and carbonate of lime in the bones, in fixed and definite proportions; when we invariably find a nearly fixed proportion of chloride of sodium, alkaline phosphates, and other soluble salts, in the blood, flesh, milk, &c.; and when, further, we find that these substances are being constantly eliminated by the urine, it is obvious that they must be replaced by the food, if we would keep the organism in its normal state. The evil consequences of a deficiency of any of these ingredients of food are well known; thus, when too little phosphate of lime (to which bone owes its firmness and hardness) is taken into the system, or when too much is again taken out (as occasionally, during pregnancy, when the fœtal bones require it for their ossification), fractures do not readily unite.

It is only comparatively recently—during the last quarter of a century—that physiologists have satisfied themselves, that in order to supply the wants of the system, food must consist of a combination of these groups; and that animals which are fed exclusively on food belonging to one of the groups—as, for example, albumen or fibrin—perish under symptoms of inanition, as certainly as if they had been deprived of all nourishment. As in the infant's milk we find the albuminous, oleaginous, saccharine, and saline groups represented by the caseine, butter, sugar, and salts, so, for other periods of life, the food, whether derived from the animal or vegetable kingdom, must contain a due (although not necessarily the same) proportion of the different types. Again, in judging of the nutritive value of any kind of food, we must take into consideration its digestibility. Thus, the experiments made by Dr Beaumont on Alexis St Martin, a Canadian, in whom there was, in consequence of a gun-shot wound, a fistulous opening leading from the exterior to the interior of the stomach, and recent experiments made by Busch on a woman with a fistulous opening into the jejunum (see ALIMENTARY CANAL), shew, for example, that hard-boiled eggs, meat that has been boiled for a long time, and hard cheese, which is poor in fat, are less easily and rapidly digested than soft-boiled or fresh eggs, meat steeped in vinegar, or moist, fat cheese, and that starch is much more readily converted into sugar when boiled than in the raw form.

As the nitrogenous constituents of the food (articles containing albumen, fibrin, &c.) are chiefly employed in the formation of the blood and the reproduction of the tissues, it was at one time thought that the quantity of nitrogen which any kind of food contained might be taken as a measure of its nutritive value; but this test is not altogether to be relied on, since the nitrogen in part depends upon the gluten-yielding matters, which probably contribute little or nothing to the formation of textures.

Both daily experience and chemico-physiological observations shew us, that the best kinds of food contain both fat and carbo-hydrates, in addition to albuminous matters. Instinct teaches us to combine highly amylaceous foods with fats; as, for example, bread and butter, beans and fat bacon; and the increased digestibility of such mixtures proves, no less than the simultaneous occurrence of fat and sugar in the milk and in the egg-fluids, that both substances are necessary, as independent ingredients of food, although, perhaps, one may temporarily serve as a substitute for the other. Unfortunately, we have no trustworthy data for enabling us to determine the proportion in which the different nutrient groups should be combined, so as to form the food best suited to the general wants of the organism. The proportions occurring in human milk are the following: 10 parts of plastic or blood-forming matter (caseine), 10 parts of fat (butter), 20 parts of a carbo-hydrate (sugar), and 0·6 of a part of salts. For the wants of adult life, a lesser ratio of plastic matter (albumen, &c.) would probably suffice.

The absolute quantity of food required for the maintenance of the human body in health varies so much with the age, sex, and habits of the individual, and with the circumstances in which he may be placed, that it is impossible to fix a standard applicable to every case; but from the consumption of food by large bodies of healthy men, such as our soldiers and sailors, we can determine with tolerable accuracy the *average* daily quantity. We extract the following remarks from Todd and Bowman's *Physiological Anatomy and Physiology of Man.* 'Each seaman in the British naval service is allowed from 31 to 35½ ounces of dry nutritious food daily, of which 26 ounces are vegetable, and the rest animal; the latter consisting of 9 ounces of salt meat, or 4½ of fresh. Sugar and cocoa are also given. The soldier is allowed a pound of bread, and three-quarters of a pound of meat. In most of the London hospitals, full diet, which is given to convalescent patients who need a liberal diet, consists generally of half a pound of meat, with from 12 to 14 ounces of bread, half a pound of potatoes, a pint of milk, and sometimes beer or porter—a pint of the former, or half a pint of the latter. The former dietary is destined for men who must be in readiness for the most active athletic exercises, requiring not only great muscular strength, but also considerable power of enduring fatigue. The latter is intended to recruit the powers of those who have been suffering from disease. If, now, we compare with these a dietary which has been found sufficient for the support of health in a state of more or less confinement, with a moderate amount of daily labour, we may fairly infer that the proper allowance for persons not engaged in actual manual labour lies between these extremes. In the union workhouses of England, able-bodied men obtain about 25 ounces of solid food daily, of which the quantity of meat does not exceed 5 or 6 ounces. In prisons, it has been found necessary to give a certain amount of animal food to prisoners who are subject to hard labour. Each of such prisoners, if confined for a term exceeding three months, and kept at hard labour, has a daily allowance of about 36 ounces of food, of which meat constitutes only a very small portion—namely, about 16 ounces in the week. The prisoner has obviously the advantage of the poor man, whose only crime is poverty; but there is doubtless sufficient justification for this in the fact, that the labour of the prisoner, and the mental depression which long-continued restraint and confinement induce, render a greater amount of nutriment necessary than the indigent would require, who seek in the workhouse a shelter from absolute want.' For further details on this subject, which is one of great practical importance, we may refer to a paper by Dr Lyon Playfair, 'On the Food of Man under Different Conditions of Age and Employment,' published in 1854, in the 56th volume of the *Edinburgh New Philosophical Journal*, and to a memoir by Dr E. Smith upon 'Prison and other Dietaries,' in the *Transactions of the Society for the Promotion of Social Science*, 1858.

It appears, then, that a daily amount of food, varying from 35 to 25 ounces, is sufficient to maintain health; and of this a fourth or fifth part ought to be animal food; but in special cases, much more or much less may be taken without apparent injury. The smallest quantity of food upon which life is known to have been supported with health and strength, is that on which Cornaro—whose history is recorded in most books on Diet and Dietetics—states that he subsisted, in order to reduce extreme corpulence, for a period of fifty-eight years—viz., 12 ounces of food, chiefly vegetable, with 14 ounces of light wine. In contrast with Cornaro's case, we may refer to instances recorded by Parry and other arctic voyagers of the voracity of the natives of those cold regions. A young Esquimaux, who was allowed 'unlimited diet,' availed himself of the privilege to the extent of devouring, in 24 hours, 35 lbs. of various kinds of food, including tallow-candles; and the Cossacks of Siberia are reported to consume daily from 12 to 20 lbs. of animal food.

An article upon diet would be imperfect without a reference to the best mode of dressing meat, for cookery and digestibility are closely allied. Most persons find meat that has been broiled most easily digested. The fire should be brisk, so that the albumen on the surface of the meat may be coagulated rapidly, and thus retain the internal juices. A similar rule applies, for the same reason, to boiling and roasting. When meat is to be boiled, it should be plunged into water already boiling; while, if soup is to be made, the meat should be put into cold water, and the temperature slowly and gradually raised—the object, in the former case, being to retain, in the latter, to extract, the nutritious fluids. (See BOILING and BROILING.) Fried meat and rich stews are usually very indigestible. Salted meat is not only harder and more indigestible than fresh meat, but the process of salting extracts important salts, and much of the nutrient juice from the meat; the only exception being fat pork, which is rendered more digestible by salting. On this subject, see Liebig's *Researches on Food*, 1847.

We shall conclude with a notice of certain substances which, although they are hardly entitled to be termed foods, may fairly be considered, from the universality of their use, to exert a definite influence on the organism, and to supply certain existing, although, perhaps, undefined wants. We refer to alcohol, tobacco, tea, and coffee.

From three series of observations made upon himself, Dr Hammond arrives at the conclusion, that 'alcohol increases the weight of the body, by retarding the metamorphosis of the old, and promoting the formation of new tissues, and limiting the consumption of fat.' The respiratory and urinary excretions, and the fæces, were invariably diminished. These effects occurring when the amount of food was below the quantity required to maintain the weight of the body, were productive of no deleterious result to the system; but when the food was sufficient to balance the waste from the excretions, and still more, when an excess of aliment over the demands of the system was ingested, the health was disturbed, and disease almost induced. Hence the labouring-man, who can hardly find bread and meat enough to preserve the balance between the formation and decay of his tissues, finds in alcohol an agent which, if taken in moderation, enables him, without disturbing his health, to dispense with a certain quantity of food, and yet keeps up the weight and strength of his body. On the other hand, he who uses alcohol when his food is more than sufficient to supply the waste of tissue, and, at the same time, does not increase the amount of his physical exercise, or drink an additional quantity of water (by which the decay of tissue would be accelerated), retards the metamorphosis, while an increased amount of nutriment is being assimilated, and thus adds to the plethoric condition of the system which excessive food has a tendency to produce.

Tobacco, according to the experiments of the same excellent observer, resembles alcohol in these respects, that when the food is sufficient to preserve the weight of the body, it increases that weight; and when the food is not sufficient, and the body, in consequence, loses weight, it restrains that loss; but it differs from alcohol in being unattended with any unpleasant effects upon the circulation, though its action on the brain is apparent in increased nervous excitement, followed by a pleasant feeling of ease and contentment. In these experiments, Dr Hammond, who was not in the habit of using tobacco in any form, smoked 450 grains daily.*

Tea and coffee are usually believed to have a somewhat similar effect to that which, as we have shewn, is produced by alcohol and tobacco. The power of tea in arresting the waste of tissues has, however, recently been called in question by Dr Edward Smith in a memoir 'On the Chemical and other Phenomena of Respiration,' published in the *Philosophical Transactions* for 1859.

**DIET**, Desertion of. The proceedings under a criminal libel are in Scotland spoken of technically as a diet, and when the libel is abandoned by the public prosecutor, or where he fails to appear, he is said to desert the diet. The effect of a judgment of the court declaring that the diet has been deserted, is to free the accused from prosecution under the particular libel or writ, but not to prevent a new process being raised on the same grounds. Where a defect or informality has been discovered in the libel, the prosecutor may apply to the court to desert the diet *pro loco et tempore*, by which means he reserves his right to insist of new, which would be lost were he to allow the trial to proceed to an acquittal. If the prosecutor's motion be, that the court shall desert the diet *simpliciter*, the accused will be thereby finally discharged; and this motion it is in his power to make, even after a verdict of guilty has been returned by a jury. In point of law, the Lord Advocate, or his depute who is prosecuting in his name, has it in his power at the very last to save the life of a prisoner, either by moving the court to desert the diet, or by declining to move for sentence. The power, however, is one which public opinion in the present day effectually restrains him from exercising, and which, if once exercised, would certainly be abolished.

**DI'ETARY**, Military. The chief matters concerning the dietary or sustenance of the troops in the British army, and, indirectly, in those of other countries, will be found noticed under Bakeries, Army; Commissariat; Cookery, Army; and Ration.

**DIETARY**, Naval. In fitting out ships for the royal navy, the quantity of victuals is calculated on two data—the established allowance or ration of certain articles, and the average experience of past years in regard to certain others. Under the first category, the ration is everywhere equal, from the admiral down to the humblest sailor; under the second, the differences are very wide. Certain articles are regarded as 'non-guaranteed' to the ordinary crew, to be given or withheld according to circumstances: such as fresh meat, preserved meat, lemon-juice, and wine.

The dietary in relation to kind and quantity of food has been changed from time to time. In 1844, the daily ration was set down thus: 1 lb. biscuit, ¾ lb. salt meat, ½ lb. vegetables, 1½ oz. sugar, 1 oz. chocolate, ¼ oz. tea, and ¼ pint rum. When the meat was beef, ¾ lb. flour was added; when pork, ½ pint of pease in lieu of the flour. Besides these daily allowances, ½ pint oatmeal was given weekly, and vinegar when wanted, usually also half a pint per week. Fresh vegetables being not at times obtainable, preserved vegetables may not be in store, and circumstances may render it easy to obtain supplies of fresh meat, suet, raisins, currants, loaf-bread, rice, sago, coffee, cocoa, barley-meal, butter, cheese, onions, leeks, wine, beer, &c. At such times the dietary undergoes a temporary change, very acceptable to the crew. If the sailors draw less than their rations, they receive a money equivalent at stated intervals. The cost of the dietary to the state, on the basis of 1844, was about £18 per man per annum.

The British government have never attempted the temperance system in the navy, but they offer facilities to such seamen as choose to adopt it. In 1847, a plan was introduced for giving tea and sugar in lieu of rum. Many of the seamen have in this way abandoned spirituous liquors, but not to so great an extent as the seamen of the United States navy.

In 1859, when the Admiralty desired to increase the attractiveness of the royal navy, the dietary was made more liberal in certain particulars. The allowance of biscuit was increased to 1¼ lb., and of sugar to 2 oz.; together with an addition of chocolate and sugar during a cold night-watch, or when exposed to severe weather. In foreign countries, with a few exceptions, the naval dietary, whether in war or trading ships, is less liberal than that of England.

The dietary for emigrants is regulated by law. Every emigrant ship is bound to be provided with certain kinds and quantities of provisions, according to the number of emigrants and the length of the voyage. The chief owners of passenger-ships engaged in the Australian and other distant trades, now pay great attention to this subject, as one which affects the good name of the several firms.

**DIETS OF COMPEA'RANCE**, in the law of Scotland, are the days on which a party to a civil or criminal process is cited to appear in court. Formerly, there were two diets, because there were two summonses; but by the judicature act, in 1825, it was enacted that all summonses should henceforth proceed on one diet. By 13 and 14 Vict. c. 36, s. 21, the period allowed to the defender (see Induciæ) was shortened from 20 to 14 days for persons within Scotland; and for persons in Orkney, or in Shetland, or furth of Scotland, from 40 and 60 days respectively, to 21 days in both cases. In the sheriff-courts, the period is six days (16 and 17 Vict. c. 80). See Summons, Indictment, Induciæ.

**DIEZ**, Friedrich Christian, the founder of the philology of the Romanic languages, was born at Giessen, 15th March 1794, and educated at Giessen and Göttingen. During the greater part of the years 1819 and 1820, he lived at Utrecht as a domestic tutor. In 1822, he went to Bonn as a *privat-docent*, and in 1830 was there appointed Professor of Modern Literature. His first work, *Altspan. Romanzen*, was issued in 1821. Since then, he has published a great number of valuable works on the Romanic languages, two of which are worthy of special mention—the *Grammatik der Romanischen Sprachen* (Grammar of the Romanic Languages, 3 vols., Bonn, 1836—1842), and the *Etymologisches Wörterbuch der Romanischen Sprachen* (Etymological Dictionary of the Romanic Languages, Bonn, 1853). The last of these works, in particular, is recognised not only by Germans, but by the scholars of all the Romanic nations, to be the basis for the scientific study of all the modern languages derived from the Latin.

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* Dr Brinton, in his excellent article on 'The Stomach and Intestine,' in the *Cyclopædia of Anatomy and Physiology*, refers to an instance of the partial starvation of a large ship's crew on a long voyage, in which the *chewers* of tobacco were alleged to have endured hunger far better than the other sufferers, while the *smokers* did not enjoy the same advantage. This fact, however, does not invalidate our statement, and only shews, as we might *à priori* have expected, that the effects of chewing are more powerful than those of smoking. When the system receives its due supply of food, we do not advise the use of tobacco in any form.

**DI'FFERENCE; DIFFERENCES; CALCULUS OF FINITE DIFFERENCES.** The word difference means usually the excess of one quantity over another of the same kind, and this is its meaning in arithmetic. In the higher branches of mathematics, however, it has a peculiar meaning, which we shall briefly explain. When we have a series of numbers connected by a regular, though not obvious law, the character of that law may be detected by forming a new series of the *differences* between each term of the original series and the next, and then treating the new series (which we may call the series of 'first differences') in the same way; and so on, till we reach a series of differences the law of which is manifest. Thus,

Given series, . 4, 7, 11, 18, 31, 54, 92, 151
First differences, 3, 4, 7, 13, 23, 38, 59
Second differences, 1, 3, 6, 10, 15, 21
Third differences, . 2, 3, 4, 5, 6

The law of the series of third differences is manifest; we see that its next term must be 7, which gives 28 as the next term of the series of second differences, 87 as the next of the first differences, and so 238 for that of the original series, which we can thus continue to any number of terms. To take a simpler case. Let the series be

43, 47, 53, 61, 71
First differences, . . 4, 6, 8, 10
Second differences, . . 2, 2, 2

Here the law is manifest in the first differences, and we should be able to calculate the series if we knew the first terms of the three series; viz., 43, 4, 2. It is on this principle that calculating machines (q. v.) can be constructed to compute tables of logarithms, &c. Out of the method of Differences sprung the Calculus of Finite Differences, first treated by Dr Brook Taylor, under the name of the Method of Increments. This calculus has nothing to do with the Transcendental Analysis. See CALCULUS DIFFERENTIAL, &c. It deals with the changes of functions when *definite* increments are made to the variables; while the Transcendental Analysis considers only their changes when indefinitely small or infinitesimal additions are made to the variables. It would be out of place here to attempt an account of the Calculus of Finite Differences. See FUNCTIONS.

**DIFFERENCES,** in Heraldry, though often, or indeed generally, confounded with marks of Cadency (q. v.), have, in strict usage, a totally different function—the former being employed to distinguish brothers and their descendants after the death of the father, the latter whilst he is still alive. Differences in this limited sense may consist either of a chief added to or a bordure placed round the plain shield borne by the head of the house; or should the shield exhibit any of the Ordinaries (q. v.), as the bend, fess, pale, &c., the difference may be indicated by an alteration on the lines. The proximity of the bearer to the head of the house is indicated by the character of the line by which the differencing chief, or bordure, or ordinary is marked off from the field, the following being the order usually observed: the first or eldest brother, on the death of his father, inherits the pure arms of the house; the second brother, if the difference is to consist of a bordure, carries it plain; the third, ingrailed; the fourth, invected; the fifth, embattled; &c. Other modes of differencing have been invented by heralds, and are not unknown to practice; such, for example, as changing the tinctures either of the field or of the principal figures, of which Nisbet gives many famous examples—altering the position or number of the figures on the shield, adding different figures from the mother's coat or from lands, and the like. Where the cadet is far removed from the principal family, if the field be of one tincture, it is sometimes divided into two, the charge or charges being counter-charged, so that metal may not lie on metal, or colour on colour. The confusion between differences and marks of cadency, above referred to, is by no means peculiar to the heraldic usage of England, though there it is more prevalent than in Scotland. In France, the cadets of the House of Bourbon have been in the habit of continuing these marks, and at the present day, as in Mackenzie's time, the label or lambel is to be seen on the arms of all the members of the Orleans family. That no distinction between what we call marks of cadency and differences was there observed, is further apparent from the fact that, whilst such was the practice of the House of Orleans, the House of Anjou carried a bordure gules, and that of Alençon a bordure gules charged with eight bezants. In Germany, Sir George Mackenzie says that the several branches of great families distinguish themselves only by different crests (*Precedency*—Works, ii. 616); and he gives as the reason, that all the sons succeed equally to the honours of the family. In Britain, and in France, some change is always made on the shield as carried by the head of the house; but the practice even of good heralds has been so irregular, as to bring the rule very nearly to what Mackenzie holds to be the correct one—viz., that every private person should be allowed, with the sanction of the proper authorities, 'to make what marks of distinction can suit best with the coat which his chief bears.'

**DIFFERENCES,** CALCULUS OF. See DIFFERENCE.

**DIFFERE'NTIAL CALCULUS.** See CALCULUS.

**DIFFERENTIAL THERMO'METER.** See THERMOMETER.

**DIFFRA'CTION, or INFLE'CTION,** of the rays of light. It was observed by Grimaldi, that if a beam of the sun's light be let into a dark room through a very small hole, the shadows of things in this light will be larger than they ought to be if the rays passed by the bodies in straight lines, and that these shadows have three parallel fringes, bands, or ranks of coloured light adjacent to them.

This phenomenon was originally known under the name of diffraction, and was supposed to arise from the refraction of the atmosphere. This explanation was disproved by the observations of Newton, who, from the conception which he was led to form of it, called the phenomenon the 'inflection of the rays of light.' It is now identified with a larger class of phenomena, which have been much more completely explained in the later development of the theory of light, and are assigned, on the hypotheses of Fresnel, to the interference of undulations. See INTERFERENCE. The observations and experiments of Newton on the subject, as detailed in the third book of his work on Optics, are, however, extremely interesting and instructive, and with regard to accurate observation and description, apart from the imperfect state of the theory, leave nothing to be desired.

Having made in a piece of lead a small hole with a pin, whose breadth was the 42d part of an inch, Newton let into the darkened chamber a beam of the sun's light. In this light, the shadows of all bodies were bordered with three parallel fringes or bands of coloured light. The shadow of a hair, too, was found to be much broader than the hair itself, and fringes of light were observed within it.

Again admitting light into the darkened apartment by a hole a quarter of an inch wide, he allowed it to pass between two knife-edges parallel to one another. In this case, owing to the breadth of the hole by which the light was admitted, the fringes did not appear within the shadows of the knives until the knife-edges were brought to approach one another, when they appeared. By making the hole smaller through which the light was admitted, they became more distinct. 'As the knife-edges continually approached one another, the fringes grew distincter and larger, until they vanished. The outmost fringe vanished first, and the middlemost next, and the innermost last; and after they were all vanished, and the line of light which was in the middle between them was grown very broad, a shadow began to appear in the middle of this line, and divide it along the middle into two lines of light, and increased until the whole light vanished. This enlargement of the fringes was so great, that the rays which go to the innermost fringe seemed to be bent above twenty times more when this fringe was ready to vanish, than when one of the knives was taken away.'

The order of these phenomena is then made clear by the following experiment: 'I caused the edges of two knives to be ground truly straight, and pricking their points into a board, so that their edges might look towards one another, and meeting near their points, contain a rectilineal angle, I fastened their handles together with pitch, to make this angle invariable. The distance of the edges of the knives from one another at the distance of four inches from the angular point, where the edges of the knives met, was the eighth of an inch; and therefore the angle contained by the edges was about 1° 54′. The knives thus fixed together I placed in a beam of the sun's light, let into my darkened chamber through a hole the 42d part of an inch wide, at the distance of 10 or 15 feet from the hole.' When the fringes of the shadows of the knives fell perpendicularly upon a paper at a great distance from the knives, they were in the form of hyperbolas, and are represented in the following figure.

In the diagram, CA, CB, are lines drawn upon the paper parallel to the edges of the knives, and between which all the light would fall, if it passed between the edges of the knives without inflection. The lines *eis*, *fkt*, and *qlv*, represent the terminus of the shadow of one of the knives, the dark line between the first and second fringes of that shadow, and the dark line between the second and third fringes of the same shadow. The lines *xip*, *ykq*, and *zlr*, represent the same lines corresponding to the other knife-edge. These lines are hyperbolas, having for asymptotes the line DE, and lines parallel to CA, CB, respectively.

It will be seen that in this experiment the fringes become wider towards the narrow end of the opening, just as in the former case they became wider as the knife-edges approached one another.

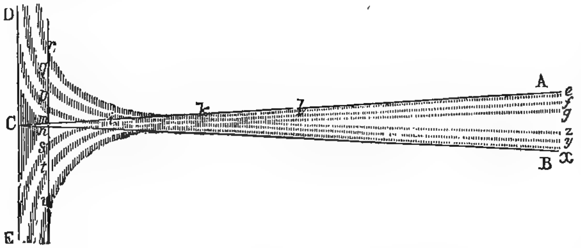


Fig. 1.

The best mode for exhibiting the phenomena of diffraction, and that now generally adopted for that purpose, is as follows: The rays of sunlight being reflected horizontally through an aperture into a darkened apartment, are concentrated by a combination of lenses to a very small focus. By this means the light is made to diverge from a very small circle, with the advantage of a greater concentration of light than is obtained by simply admitting the sunlight through a small aperture. The edges of the shadows of every object placed within the cone of light diverging from this focus, will exhibit the fringes above described.

By means of metal-leaf arranged upon a plate of glass, as in the accompanying diagram (fig. 2), shadows can now be thrown upon a screen, so as to exhibit at once all the most peculiar phenomena of this class.

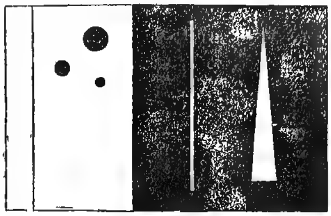


Fig. 2.

The figures *b*, *c*, in the accompanying diagram (figs. 3 and 4), represent the appearance presented by the shadow of a wire and of a small circular disc.

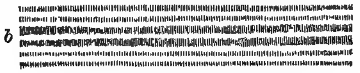


Fig. 3.

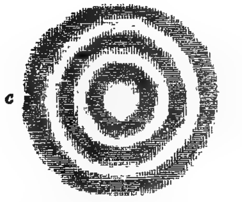


Fig. 4.

The following is a popular explanation of the phenomenon above described as now understood. Supposing light to be propagated by undulations proceeding from a single small source or focus at A (fig. 5): let B*b* be a section of the front of a wave of this light, that is, a section of a surface passing through all the particles which are at the same instant in the same phase of vibration. Let C*c* represent the front of the same wave, when it has passed through the additional space BC. The vibrations of the particles in C*c* are the consequence of the vibrations previously existing along the space B*b*. But then, the motion of the particle at C is determined not alone by the previous motion of the point B, immediately opposite to it, but is affected more or less by the motions of every point in the surface B*b*. If, therefore, the vibrations over a portion of the space B*b*, be intercepted by a dark object *de*, placed there,

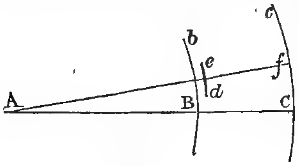


Fig. 5.

the circumstances which determine the motion of the point C, may be totally changed; and taking into account the united effect of these vibrations, it may be found that the result, instead of light, will be darkness. Again, if a point *f* be taken directly behind the dark body *de*, although the vibrations over the space *de*, which would otherwise affect it, are stopped, it may still be affected by the vibrations in the remainder of the surface B*b*; and if the combined effects of these be such as to cause in it a sufficient vibration, there will be light at the point *f*, though it is properly within the shadow of *ed*. It is impossible here to go further into detail, and it can only be said that, on the assumption of Fresnel, the explanation of the whole phenomena above described is most complete and satisfactory, the fringes and dark lines being produced by the undulations alternately strengthening or destroying each other. A very beautiful experiment, devised by Fresnel for the purpose, is found to furnish a complete verification of the theory. See INTERFERENCE.

**DIFFU'SION**, the gradual dispersion of particles of one liquid or gas among those of another—or of the particles of a solid in a liquid holding it in solution. It is of the greatest importance in terrestrial physics, being the cause of the uniform composition of the atmosphere at all elevations, and one of the causes of the speedy dissipation of noxious gases and vapours in the open air, and of the nearly uniform saltness of the sea, &c., so necessary to animal and vegetable life.

We shall consider the above cases in detail, and in addition the transfusion, as it has been called, which occurs when different gases or liquids are separated from each other by a porous plate or membrane. The principal experiments on this subject are those of Graham and Bunsen—to be found in the *Philosophical Transactions* or Graham's *Chemistry*, and in Bunsen's *Gasometry*.

1. *Diffusion of Gases.*—If two flasks be filled, one with hydrogen, the other with chlorine, and connected by a long tube fitted into their necks by corks—in whatever position the compound apparatus be placed it will be found that the gases mutually interpenetrate—in this particular case the colour of the chlorine enables us to follow by the eye the course of the diffusion. When the mixture has attained its permanent state, each of the gases is found to be uniformly diffused through the whole containing space, precisely as it would have been had the other not been present. In fact, the presence of a second gas seems merely to affect the *time* which the first takes to distribute itself equably throughout the vessel, and in no other way to influence the final result. (Dalton, long ago, suggested the analogy of the passage of water among stones in the bed of a river.) The pressure of the mixture is the sum of the pressures corresponding to each of the gases, if separately occupying the space which they jointly fill; and the same is true of a mixture in any proportions of any number of gases, so long, at all events, as they do not act chemically upon each other.

Precisely the same is true of vapours. If, for instance, a few drops of ether be injected into an exhausted receiver, there will be an almost instantaneous conversion of a definite quantity into vapour, so that its tension shall have a certain value depending on the temperature alone. If air be present in any quantity whatever, the vaporisation will proceed more slowly, but the final amount converted into vapour will be the same as in the former case. A familiar illustration of this is afforded by the dew-point, which is a temperature merely, having no connection with the height of the barometer.

Next let us take the case of a gas forced by difference of pressures from one vessel to another through a very small hole in a thin metallic plate—one of the vessels, for instance, being full of the gas, and the other connected with an air-pump kept continually in action. Experiment, and theory such as it is, agree in giving in this case, for the velocity with which the different gases pass through the orifice, under similar circumstances as to pressure, a result inversely proportional to the square root of the density of each gas. Now, if, instead of the plate with the small hole, we substitute a thin layer of bladder or other membrane, or a thin disc of plaster of Paris, it appears from experiment that the results are sensibly the same. Thus, if we have the same gas at different pressures on opposite sides of such a layer or disc, the rate of passage of the gas through it, from greater to less pressure, will, for the same pressures, but different gases, vary according to the above law; and, moreover, the presence of a second gas will in no degree modify the rate of transfusion of the first. If, therefore, a glass tube, say an inch in diameter, and two or three feet long, have a diaphragm of plaster of Paris formed near one end, and that end ground flat, so as to be perfectly closed by a glass plate, it may be filled with hydrogen by displacement, its other and lower extremity being plunged into water, and care being taken not to wet the diaphragm. If the glass plate be now removed, transfusion will take place—hydrogen passing out as if into a vacuum, and the constituent gases of air entering also as if into a vacuum. On account of the comparative lightness of hydrogen, the velocity with which it escapes will be considerably greater than that with which the others enter; so that the immediate effect will be a rise of the water in the tube. After a short time, the whole of the hydrogen escapes, and the tube will contain only air. The proportion of the volume of the latter to that of the hydrogen may be calculated from the above law—remembering that the hydrogen is practically diffusing into a vacuum all along, and the air entering by the pressure of the atmosphere in excess over that of the air in the tube. Allowing for the unavoidable errors of experiment, the verifications of these results are very satisfactory. It has been attempted to deduce these laws as consequences of the dynamical theory of gases. See a remarkable paper by Maxwell in the *Philosophical Magazine* for 1860.

Bunsen has suggested the application of the method of diffusion to the very important question in gas analysis—whether the constituents of a gas, as determined by the usual methods, are merely *mixed*, or are chemically united. It is evident that, in general, the diffusion rate of a mixture of two gases will differ from that of a compound of the same.

2. *Diffusion of Saline Matters in Solution.*—If a strong brine be placed in the bottom of a tall glass jar, pure water may be carefully introduced above it, so that no immediate mixture takes place. If the whole be allowed to stand, the salt is gradually diffused through the vessel, which, after a sufficient time, will be found to contain a brine of uniform strength. Experiments have been carefully made to determine, in such a case as the above, the distribution of the salt through the vessel at various

periods *before* the permanent state has been arrived at. They have been compared with the results of the theory now to be explained, and the coincidence has been found very satisfactory. The theory assumes that the rate of diffusion between contiguous layers of the water in the cylinder is proportional to the excess of salt in one layer above that in the next—the co-efficient of proportionality involving a special constant of diffusion for the particular salt experimented upon. This is precisely the assumption that is made about the linear conduction of heat in a homogeneous solid, or the propagation of electricity in a wire. The partial differential equation to which all of these cases are reducible, $\left(C\frac{du}{dt} = \frac{d^2u}{dx^2}\right)$, was obtained, and its complete solution exhibited in various forms long ago by Fourier, in his *Théorie dc la Chaleur*, one of the most remarkable mathematical investigations of last generation. See HEAT, CONDUCTION OF, and ELECTRICITY, THEORY OF. It is curious to consider the heating of a metallic rod, or the solution of a few crystals of salt in a tall glass jar full of water, as problems thus directly allied to the signaling through the Atlantic cable.

Graham's method of determining the diffusion co-efficient of a salt in water was simple, and yet admitted of great precision in the determinations. A number of glass bottles, cast in the same mould, had their mouths ground flat, so as to be accurately closed by a plate of glass, which—when the bottle, filled with a solution of known strength, had been carefully placed in one of a series of equal glass jars, and covered with a constant amount of water—could be slipped off without producing any considerable disturbance in the fluid. After a measured time, the glass plate was replaced, and the amount of salt which had left the bottle accurately determined.

The following are the most important of the laws thus obtained; they are quite consistent with the theory above mentioned. For solutions of the same substance, of different degrees of strength, the rate of diffusion is proportional to the strength of the solution. Different salts seem to arrange themselves in groups as regards their diffusion coefficients, the latter having simple numerical relations to each other. Analogy of chemical composition and of crystalline form appear to be the principal elements in the arrangement of the groups. The quantity diffused increases with the temperature, and at the same rate for all salts. The presence of a second salt in the solution, or in the water into which the diffusion takes place, if not in large quantity, appears not to affect the result, supposing, of course, that no chemical action takes place. It is evident that by this process a partial separation may be effected of salts which have different rates of diffusion, and do not act chemically on each other; and it is found that in certain cases even chemical compounds, such as alum, may be partially decomposed by the same means.

3. *Diffusion of Liquids. Osmose.*—If sulphuric acid be carefully poured through a tube into the bottom of a vessel filled with water, coloured by an infusion of litmus, or red cabbage, the change of colour of the vegetable dye will enable us to trace the gradual diffusion of the acid in the water. Here, the process, though probably on the whole quite analogous to the case of gases, occupies more time; but the final result is, as in the former case, an almost uniform mixture of the two fluids. There is no necessity for any special remark on this part of the subject, particularly as we have already adverted to the theory of this process. But if different fluids be separated by a membrane or diaphragm, some extremely remarkable results are obtained, which were first carefully examined by Dutrochet. These have been attributed to the action of osmotic force, something of the same kind as capillary force, and probably a closely connected, if not identical form of molecular action. The theory of these actions is not yet well understood, but we shall endeavour to give from analogy a few attempts at explanation.

If an inverted funnel, with a very long stem, have a bladder tied over its mouth, and, being filled to the neck with syrup of sugar, be suspended so that the bladder is entirely under the surface of water in a dish, the syrup will pass through the bladder into the water, and the water will pass through in the opposite direction, but in far greater quantity—producing the extraordinary effect of a rise in the level of the fluid in the tube, which can with precaution be made to amount to a yard or two in the course of a few days. The points of the attempted explanation of this phenomenon are somewhat as follows: The bladder has more capacity for, or will absorb more of, water than of syrup. The first effect, then, is to saturate the bladder with water, very slightly mixed with syrup. On the lower side of the bladder, water, with a small quantity of sugar in solution, is diffusing into pure, or nearly pure water, this process will be a slow one; at the upper side, water (nearly pure) is diffusing into a strong syrup. Here, then, the effect is much greater, and thus a greater quantity of water passes upwards than of syrup downwards. Similar effects may be produced with a vast number of other liquids. Combined with capillarity, it is believed that these experiments explain the motion of the sap in vegetables, and various other phenomena in the vegetable and animal kingdoms.

**DIGA'MMA**, an obsolete letter of the Greek alphabet, equivalent in sound to the English *v*. In some of the earlier Greek dialects the old γ was a kind of aspirate, which, from its form, like one capital Γ over another, was called digamma, and written Ϝ. The Pelasgians carried this aspirate into Italy, where it remained in Latin as a real consonant, in such words as *vinum*, *ovum*, from the Greek Ϝοῖνος, Ϝῶον. The digamma had disappeared as a character from the Greek language before the days of Homer.

**DI'GBY**, a small seaport of Nova Scotia on the Bay of Fundy, reputed for its curing of a variety of small herrings or pilchards, which are smoked and dried for export; they have a high flavour, and are known in trade as Digbies.

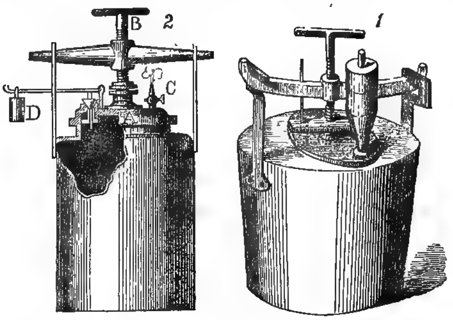
**DIGBY, SIR KENELME**, the son of Sir Everard Digby, noted as one of the Gunpowder Plot conspirators, was born in 1603, three years before the execution of his father. He was brought up in the Protestant faith, and at the age of 15 was entered at Gloucester Hall, Oxford. After leaving the university, where he had acquired the reputation of great ability, he spent two years in continental travel. He returned to England in 1623, and was knighted in Lord Montague's House. Under Charles I., he was a gentleman of the bedchamber, and held several public offices. In 1628, he equipped a squadron at his own expense, and sailed first against the Algerines, and subsequently against the Venetians. In 1632, on the death of Dr Allen, of Gloucester Hall, D. inherited his collection of books and manuscripts. In 1636, when in France, he was converted to the Roman Catholic faith. He returned to England in 1638, and on the breaking out of the Civil War, he was imprisoned as a royalist in Winchester House, but in 1643 he was allowed to retire to France. At Paris, he was received with favour by the court, and made the acquaintance of

Descartes. After Charles I. had fallen, D. returned to England, but the parliament forbade him the kingdom, under penalty of death. Retiring to the continent, he travelled in France and Italy; but in 1655, he was again in England, and was in frequent attendance at the court of the Protector. He went again to France, and busied himself with the preparation of philosophical papers. He returned to England in 1661, and died there in 1665. D. married a daughter of Sir Edward Stanley of Tongue Castle, in Shropshire, by whom he had one son.

His works are numerous, and on a great variety of subjects, comprising *A Conference with a Lady about the Choice of a Religion* (Par. 1638), *Observations on Spenser's Fairy Queen* (Lond. 1644), *A Treatise on the Soul, proving its Immortality* (Par. 1644), *Of the Cure of Wounds by the Powder of Sympathy* (Lond. 1658), and *Discourse on Vegetation* (Lond. 1661, &c.). *The Private Memoirs of Sir K. Digby, &c., written by Himself,* were published in London in 1827. D.'s library, which was removed to France when the Civil War broke out in England, became, on his death, the property of the French king.

**DI'GEST**, a name often given to the Pandects (q. v.) of the civil or Roman law, because they contained 'Legalia præcepta excellenter digesta.'

**DIGE'STER**, PAPIN'S, is a strong boiler with a closely fitting cover, in which articles of food may be boiled at a higher temperature than 212° F. As its name implies, it was invented by Papin, and a common form is the *Autoclave*, fig. 1, where the lid can be turned round under clamps or ears, and thus be rendered steam-tight. Another form is given in fig. 2, where a portion of the side is removed, to exhibit the interior. The lid A is fastened down by a screw B, and the steam generated in the boiler is allowed to escape at a stop-cock C, or by raising the weighted valve D. The increased pressure to which the contents of the boiler are exposed, causes the boiling-point of the water to rise to 400° F., and occasionally higher. The digester is of great value as a means of preparing soups of various kinds, and especially in the extraction of gelatine from bones.



Papin's Digester.

**DIGE'STION**, ORGANS AND PROCESS OF. The function or process of digestion is one of the chief of those organic functions which are directly concerned in maintaining the life of the individual, inasmuch as it is that through which the animal is enabled to receive aliment, and to prepare or modify it for being assimilated to, and appropriated by, the various organs of the body, or, in other words, for being converted into blood.

The general expression, 'function of digestion,' includes several minor or subordinate processes. According to Milne Edwards, the acts of the digestive function may be classed as follows: 1. There is the Prehension of the Food; 2. Its Mastication; 3. Its Insalivation; 4. Its Deglutition; 5. Its Chymification or Stomachal Digestion; 6. Its Chylification or Intestinal Digestion; 7. Defæcation; and 8. The Absorption of the Chyle.

Before examining these acts in succession, and the mechanism by which each is effected, we must have clear conceptions regarding the classification of food, the quantity of food, and other allied subjects, which are discussed in the article DIET; and we should likewise have some knowledge of the causes of those sensations which we call *hunger* and *thirst*, which are, or ought to be, our natural guides regarding the periods for taking food, and the quantity to be taken. The immediate cause of ordinary hunger cannot be explained; but that it is due to some peculiar condition of the gastric mucous membrane, seems probable from the fact, that the sensation continues after division of the pneumogastric nerves, from which the stomach mainly derives its nervous fibres, if we correctly interpret the feelings of the animals on which the experiments were made. In extreme hunger, the sufferer complains of a sense of sinking, which is referred to the region of the stomach, while general faintness and sometimes considerable pain are present. Hunger, or the want of food which occasions it, may be diminished by rest, sleep, or any cause that retards the general change which is perpetually going on in all the tissues of the body. We have shewn in the article DIET, that tobacco and alcohol have a power of limiting the disintegration of the tissues, and thus of keeping off or diminishing hunger. When the sensations of extreme hunger are not relieved by food, the body begins to feed upon its own tissues, and the symptoms of Starvation (q. v.) begin to manifest themselves. The period at which death occurs from abstinence, varies greatly in different animals—young animals always dying sooner than older ones. In man, total privation of food usually causes death in about a week; but if a little drink be allowed, life is considerably prolonged.

Thirst is dependent upon a peculiar condition (probably undue dryness) of the mucous membrane of the upper part of the digestive tube. The thirst in febrile affections is, however, probably due to the morbid state of the blood.

We now proceed to the consideration of the different acts of which the digestive function is made up.

1. In the act of prehension, man and many of the lower animals (monkeys, squirrels, &c.) employ the hands or anterior extremities and mouth; the lips and anterior teeth, and, to a certain extent, the tongue, being also employed in this function. In the lower animals, however, the modes of prehension are various. Some (like the giraffe) twist the tongue around the leaves and young branches of trees; others (the ant-eaters) have a remarkably long tongue, covered with a viscid secretion, and by thrusting this organ into ant-hills, &c., secure their prey; and in the chameleon among reptiles, and the woodpecker among birds, the tongue seems specially developed for prehensile purposes. In the elephant, this act is accomplished by the prolongation of the nostrils into the organ popularly known as the trunk. In other mammals (the Ruminants and Solipeds), the large pendulous lips are the organs employed. In birds, the bill (which is a modification of the lips) is always the prehensile organ of that class.

The prehension of fluids is effected in two ways: sometimes the liquid is poured into the mouth, and is allowed to fall into it by its own weight; in other cases, the tongue is used after the fashion of a piston, being drawn within the mouth so as to exhaust the anterior part of that cavity, and fluids are thus forced to enter by atmospheric pressure.

2. Mastication is effected in the cavity of the mouth by means of the teeth. This cavity is bounded superiorly by the palate or roof of the mouth, and in other directions by the cheeks, lips, and tongue. Projecting into its interior, above and below, is an arched series of teeth, which are firmly fixed by roots into corresponding sockets in the upper and lower jawbones. The upper jaw (and consequently the dental arch imbedded in it) is immovable, or only movable with the entire head; but the lower jaw, with its teeth, is capable of moving upwards, downwards, backwards, forwards, and laterally, by means of the powerful muscles of mastication. It is by the varied movements of the lower teeth against the upper, through the action of these muscles, that the food is broken down or masticated. For information regarding the structure, &c., of the teeth, see TEETH; see also DENTITION.

The operation of mastication is very important, since the more the food is broken down the more easily will it mix with the saliva and other fluids which participate in the digestive process.

3. Insalivation is effected by the admixture of the secretions of the three pairs of salivary glands (the parotids, the submaxillaries, and the sublinguals) and of the buccal mucus with the triturated food. A brief description of these structures is given in the article GLAND. The common saliva, formed by the combined secretion of these various secreting organs, is a colourless, turbid, viscid, inodorous, and tasteless fluid, which, after standing for some time, deposits a layer of pavement epithelium (see EPITHELIUM) and mucus corpuscles. In the normal state, its reaction is alkaline, but the degree of alkalinity varies, and is greatest during and after meals. Saliva does not contain more than five or six parts of solid constituents to 995 or 994 parts of water, the most important ingredients being an organic matter termed *ptyaline*, and sulphocyanide of potassium, neither of which substances occurs in any other solid or fluid of the body. The daily quantity of saliva secreted by an adult man is estimated at about 48 ounces, but determinations of this kind must be regarded only as approximations to the truth, since the activity of the salivary glands is dependent upon various influences and conditions. Thus movement of the lower jaw, as in masticating, speaking, or singing, increases the secretion; as also do acrid and aromatic substances, and dry hard food; while the use of moist and soft food is accompanied by a scanty secretion.

The uses of the saliva in reference to digestion are partly mechanical and partly chemical. The mechanical uses are almost too apparent to require notice. The moistening of the dry food by the saliva serves the double purpose of adapting it for deglutition and of separating the particles, and thus allowing them to be more freely acted on by the other digestive fluids; moreover, from its viscidity, it lubricates the bolus of food, and thus facilitates deglutition; and it is probably also subservient to the sense of taste. The great chemical use of the saliva is to convert the amylaceous (or starchy) portion of the food into glycose or grape sugar, and thus to promote its absorption.

4. Deglutition is the act by which the food is transferred from the mouth to the stomach. The pharynx, or cavity into which the mouth leads, takes so slight a part in the digestive process, that we need scarcely allude to any anatomical details connected with it. It is sufficient to observe that between it and the mouth is the pendulous or soft palate, which is a movable muscular partition that separates the two cavities during mastication. As soon, however, as the latter act is accomplished, and the bolus is pressed backwards by the tongue, the soft palate is drawn upwards and backwards, so as to permit the passage of the food into the pharynx. The bolus or pellet of food having arrived near the œsophagus or gullet (which is continuous inferiorly and posteriorly with the pharynx), is driven into it by the action of certain muscles, which almost surround the pharynx, and are termed its *constrictor* muscles. All voluntary action ceases as soon as the food is pressed backwards by the tongue into the pharynx. It is impossible to recall the pellet, and it is necessarily carried on (without even our cognizance) into the stomach. On receiving the food forced into its upper extremity by the action of the constrictor muscles of the pharynx, the œsophagus is dilated (for it usually lies in a collapsed state, with its walls in contact, or nearly so); this contact of the pellet with its mucous membrane causes its muscular walls to contract, and the food is thus driven, by a series of these contractions, into the stomach. The act of deglutition is now completed.

5. Stomachal digestion or chymification is the next process to be considered. The whole of the Alimentary Canal (q. v.), (fig. 1) below the Diaphragm (q. v.), or great muscular partition which separates the cavity of the chest from that of the abdomen or belly, possesses the following points in common, in relation to structure: The stomach, the small intestine, and the large intestine, are all lined by mucous membrane, have a muscular coat, consisting of two sets of distinct fibres—namely, circular fibres which surround the tube or viscus after the manner of a series of rings, and longitudinal fibres running in the same direction as the intestine itself—and are invested with a serous membrane, the peritoneum (see SEROUS MEMBRANES), which at the same time retains the viscera in their proper position, and permits their necessary movements.

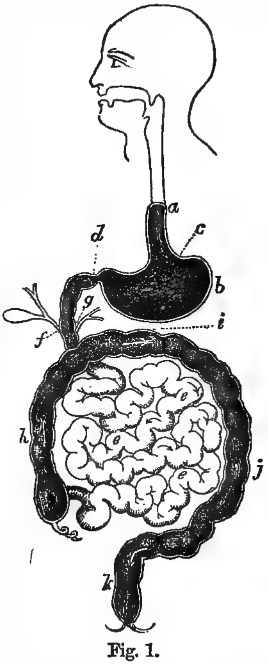


Fig. 1.

**Human Alimentary Canal.**

*a*, œsophagus; *b*, stomach; *c*, cardiac orifice; *d*, pylorus; *e*, small intestine; *f*, biliary duct; *g*, pancreatic duct; *h*, ascending colon; *i*, transverse colon; *j*, descending colon; *k*, rectum.

The human stomach is an elongated curved pouch, lying almost immediately below the diaphragm, and having the form of a bagpipe. It is very dilatable and contractile, and its function is to retain the food until it is duly acted upon and dissolved by the gastric juice, which is secreted by glands lying in its inner or mucous coat, and then to transmit it, in a semi-fluid or pulpy state, into the duodenum. Its average capacity is about five pints. The parts of it which have received special names are the greater curvature (fig. 1) *b*, the lesser curvature, upon its upper border, and the cardiac, *c*, and pyloric, *d*, extremities.

The mucous membrane, or lining coat of the stomach, is thick and soft, and lies in irregular folds, in consequence of the contraction of the muscular coat, unless when the organ is distended with food. On opening the stomach, and stretching it so as to remove the appearance of folds, we perceive even with the naked eye, but better with a lens, numerous irregular pits or depressions, irregular in shape, and averaging about $\frac{1}{200}$th of an inch in diameter. To see them properly, the mucus with which they are filled must be washed out (fig. 2, A). These pits are so shallow as not to dip into the mucous membrane to a greater extent than $\frac{1}{6}$th or $\frac{1}{8}$th of the thickness. The rest of the thickness is chiefly made up of minute tubes, running parallel to one another, and vertically to the surface of the stomach (fig. 2, B). These are the gastric tubes or glands which secrete the gastric juice from the blood in the capillaries which abound in the mucous membrane. They pass in twos, threes, or fours from the bottom of each pit, and usually subdivide into several tubes, which, after running a more or less tortuous course, terminate in blind or closed extremities. These tubes are filled with epithelial cells, whose contents are composed of granules, with which oil-globules are often mixed, and each tube is invested with capillaries, which usually run in the direction of its long axis. In the pyloric or duodenal end of the stomach, these tubes (at least in the dog and several other animals whose stomachs have been carefully examined in a perfectly fresh state) are considerably wider than those which we have described, and differ from them also in other respects; and hence some physiologists believe that while they collectively secrete the gastric juice, one set may secrete the free acid, and the other the organic matter termed pepsine; this free acid and the pepsine being, as we shall shortly see, the two essential constituents of the gastric juice.

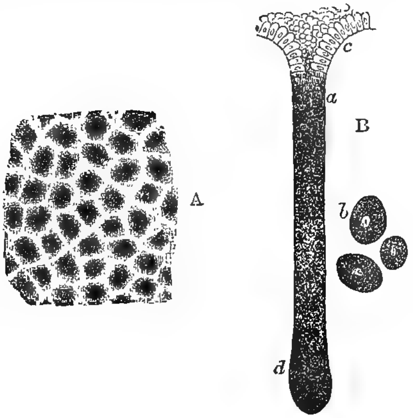


Fig. 2.

**A, inner surface of the stomach, shewing the cells after the mucus has been washed out, magnified 25 diameters. B, stomach-tube from the middle of the human stomach, magnified about 150 diameters: *a*, wall of the tube, lined with large oval nucleated cells; *b*, the same cells isolated; *c*, nucleated cells of columnar epithelium, occupying the upper parts of the tubes; *d*, blind extremity of the tube.**

When food is introduced into the stomach, three special phenomena are induced in that viscus: 1. There are certain movements induced which are dependent on its muscular coat; 2. The mucous membrane is altered in appearance; and 3. There is the secretion of the gastric juice. Each of these phenomena requires a brief notice.

On killing an animal while the act of digestion is going on, and at once laying open its abdomen, we find that the stomach is in a contracted state, firmly embracing its contents, and with both its orifices so closed as to prevent the escape of the food, this contraction being due to the stimulation of the muscular coat by the food. If we examine the movements of the stomach during digestion, which we can do either by exposing the stomach of a living animal, or by sending a magneto-electric current through this organ in an animal just killed, we perceive that, in the cardiac half or two-thirds, the movements are extremely slow, the muscular coat apparently contracting on the food, and progressively sending it towards the pylorus; whilst in the pyloric end of the stomach the movements are more energetic and rapid, resembling the peristaltic or vermicular movement, which we shall presently describe as occurring in the intestinal canal. When the transverse constriction has reached the firmly shut pylorus, a relaxation lasting about a minute ensues, followed by a repetition of the circular contractions. The movements which these contractions impress upon the food are described by Dr Beaumont in the following terms: 'The food entering the cardiac end of the stomach, *c*, turns to the left, descends into the splenic extremity, *s*, and follows the great curvature towards the pyloric end, *d*. It then returns in the course of the smaller curvature, and makes its appearance again at the cardiac aperture in its descent into the great curvature to perform similar revolutions. These revolutions are effected in from one to three minutes.' This account, given by Dr Beaumont, is based on the observations which he made in the stomach of Alexis St Martin, a Canadian, with a fistulous opening into the stomach, whose case is referred to in the article DIET. Dr Brinton, however, adopts a modified view, which is probably the correct one. He supposes that the semi-fluid food entering at *c* (fig. 3), the cardiac orifice, goes in the directions marked *a*, partly along the greater, and partly along the lesser curvature; and that these two currents of food meet at the closed pylorus, when they are both reflected into the direction *b*, forming a central or axial current, occupying the real axis of the stomach which unites the two apertures. The mutual interference of these currents at their borders causes a uniform admixture of the various substances composing them, while the reflection of the upper and lower currents into one another insures an equal contact of all the mass with the secreting surface of the mucous membrane.

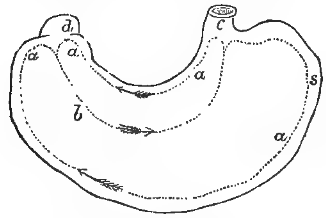


Fig. 3.

**Diagram to shew the general direction of movement impressed on the semi-fluid food in the stomach.**

*aa*, the hemispherical or surface current, carrying the semi-fluid food towards the closed pylorus, where it is reflected into *b*, the central current, which unites the cardiac (*c*) and pyloric (*d*) openings.

The changes in the mucous membrane are mainly the following: The inner surface of the healthy fasting stomach is of a paler pink tint than after the introduction of food, and while in the latter case the reaction of the moisture on the surface is very acid, in the former it is neutral, or even alkaline. Dr Beaumont found (in the case of Alexis St Martin) that, on the introduction of food into the stomach, the vessels of the mucous membrane became more injected, and that its colour became changed from a pale pink to a deep red. A pure colourless and slightly viscid fluid, with a well-marked acid reaction, was then observed to distil from the surface of the membrane, and to collect in drops, which trickled down the walls, and mixed with the food.

That the *gastric juice*, which is the term applied to the acid fluid which Dr Beaumont saw exuding from the mucous membrane, and which is secreted or formed in the gastric tubes which we have already described, is capable of exerting a solvent action on food, is proved by numerous experiments. It was first ascertained by Reaumur (1752), who obtained some of this fluid by making animals swallow sponges with a string attached, by which he could withdraw them. He thus shewed that alimentary substances out of the body were altered by this fluid in the same manner as they are changed in the stomach, and disproved the favourite theory of that period, which ascribed all the changes which the food underwent in the stomach to a species of trituration. The subject of *artificial digestion*, or digestion out of the body, has, since that period, been carefully investigated by many observers, and there is now no doubt that the changes which the food undergoes in the stomach are essentially chemical, and not mechanical.

Two years before Beaumont's experiments, Dr Prout had ascertained not only that an acid fluid is secreted by the gastric mucous membrane of rabbits, hares, horses, dogs, &c., during digestion, but that the acid is the muriatic or hydrochloric acid, and it was supposed that the solvent action of the gastric juice was due to this source. But experiments shewed that the solvent action is not due simply to the acid of the gastric juice, and that the latter must contain some other ingredient which, either alone or in combination with the acid, can exercise this power. It was then discovered that the addition of a portion of the gastric mucous membrane to water acidified with hydrochloric acid produced a perfect digestive fluid, due attention being paid to the temperature, which should be kept at about 100°, or about the normal temperature of the interior of the animal body. Later observations shewed that we can obtain from the gastric mucous membrane the special organic matter on which its digestive power depends, and to this substance the name of *pepsine* has been given. The two essential elements of the gastric juice are then: 1. A free acid, which in some cases seems to be hydrochloric alone, and in others a mixture of hydrochloric and lactic acids; and 2. An organic matter, which is found on analysis to be highly nitrogenous, and to be allied to the albuminates, and which we term pepsine. The best analysis of human gastric juice is that made by Schmidt of Dorpat, who, in 1853, had an excellent and rare opportunity of examining it in the case of an Esthonian peasant, Catharine Kütt, aged 35 years, and weighing about 118 lbs., in whom there had existed for three years a gastric fistula or opening, three or four lines in diameter, under the left breast, between the cartilages of the ninth and tenth ribs. The introduction of dry pease and a little water into the stomach, through the opening, occasioned (even in the morning, on an empty stomach) the secretion of from five to seven ounces of a clear limpid fluid with an acid reaction, which, however, was much less strong than Schmidt had observed in previous experiments on the gastric juice of dogs and sheep, in which he had artificially established similar fistulous openings. The following table gives the mean of two analyses of the gastric juice of Catharine Kütt, with corresponding mean results of the same fluid in the sheep, a purely herbivorous animal, and in the dog, a purely carnivorous animal.

| | Human Gastric Juice. | Sheep's Gastric Juice. | Dogs' Gastric Juice. |
|---|---|---|---|
| Water, . . | 994·40 | 986·15 | 971·17 |
| Solid constituents, | 5·60 | 13·85 | 28·83 |
| Pepsine, . . | 3·20 | 4·20 | 17·51 |
| Hydrochloric acid, | 0·20 | 1·56 | 2·70 |
| Chlorides of sodium, &c., | 2·08 | 6·00 | 5·83 |
| Phosphates, . . | 0·12 | 2·09 | 2·74 |

The only impurity that could affect these analyses, is the saliva that possibly might have been swallowed.

The quantity of the gastric juice secreted in 24 hours was determined by Bidder and Schmidt (*Die Verdauungs-säfte*, &c.) in the sheep to be $\frac{1}{8}$th, and in the dog $\frac{1}{10}$th of the weight of the body. If the latter ratio were true for men, a man of ten stone weight would secrete about 14 lbs. of this fluid daily. In the case of Catharine Kütt, the mean daily quantity amounted to no less than 31 lbs., or to more than a fourth part of the weight of her body. On this calculation, a man of ten stone would daily secrete 37 lbs. of gastric juice.

The uses of this fluid in reference to digestion are clear. It serves not only to dissolve, but also to modify the nitrogenous elements of the food (such as albumen, fibrin, casein, and, in short, all animal food except fat, and the blood-forming portion of vegetable food), converting them into new substances, termed *peptones*, which, although they coincide in their chemical composition, and in many of their physical properties, with the substances from which they are derived, differ essentially from them in their more ready solubility in water, and in various chemical relations. Thus, albumen is converted by the gastric juice into albumen-peptone, fibrin into fibrin-peptone, &c. According to the recent investigations (1859) of Meissner, the albuminates are simultaneously decomposed or broken up into peptones and substances which he terms *parapeptones*, which latter are not further changed by the action of the gastric juice, but are converted into peptones by the action of the pancreatic juice, with which they come in contact in the duodenum.

All the best observers agree that the gastric juice exerts no apparent action on the non-nitrogenous articles of food—namely, the fats and the carbohydrates (sugar, starch, &c.); as, however, the fats exert a favourable influence on the digestion of nitrogenous matters, it is probable that they undergo some slight, although not appreciable, modification. Gelatine and the gelatinous tissues are, as far as is known, the only nitrogenous articles of food which are not converted into peptones and parapeptones by the action of the gastric juice.

Although the main object of the gastric juice is to dissolve the albuminates, &c. (e. g., the contents of the egg, flesh, cheese, &c.), it appears from the experiments of Lehmann, Schmidt, and others, that it cannot dissolve the quantity necessary for the due nutrition of the organism. According to Lehmann, gastric juice can only dissolve $\frac{1}{20}$th of its weight of coagulated albumen, while Schmidt makes the quantity as low as $\frac{1}{45}$th. Now, since a dog secretes about $\frac{1}{10}$th of its weight of gastric juice daily, it would only be able—even taking Lehmann's estimate, which is more than twice as high as Schmidt's—to digest 5 parts of dry or coagulated albumen for every 1000 parts of its weight; but a dog, in order to keep in condition on an exclusive flesh diet—and this is its natural food—should take 50 parts of flesh, containing 10 parts of dry albuminates, for every 1000 parts of its weight. Hence its gastric juice only suffices for the digestion of half the albuminates necessary for nutrition—a result which is in accordance with the observed fact, that a considerable portion of the albuminates enters the duodenum in an undissolved state, and which will be explained when we consider the part which the intestinal juice—the fluid secreted by the various glands lying in the mucous membrane of the small intestine—takes in the digestive process. On comparing the experiments made on dogs with those made on Catharine Kütt, it appears that in the human subject the gastric digestion of the albuminates is much more imperfect than even in the dog.

The process of gastric digestion is slow. According to Beaumont's researches on Alexis St Martin, the mean time required for the digestion of ordinary animal food, such as butcher's meat, fowl, and game, was from two hours and three-quarters to four hours.

The next point to be considered is: What becomes of the matters that are thoroughly dissolved in the stomach? Are they absorbed, without passing further down the canal? or do they pass through the pyloric valve into the duodenum, and are they finally taken up by the lacteals? Two of our highest authorities in physiological chemistry, Frerichs and Donders, maintain that the absorption of the peptones commences in the stomach; but the view generally adopted is, that the albuminates, &c., which are converted into peptones, are for the most part taken up by the lacteals. The rapidity with which aqueous solutions of iodide of potassium, the alkaline carbonates, lactates, citrates, &c., pass into the blood, and thence into the urine, saliva, &c., shews that the absorption of fluids must take place very shortly after they are swallowed, and there is little doubt that the blood-vessels (capillaries) of the stomach constitute the principal channel through which they pass out of the intestinal tract into the blood. As the veins of the stomach, which are formed by the union of these capillaries, contribute to form the portal vein (see Circulation, Organs of), the absorbed matters pass directly to the liver, and probably stimulate it to increased secretion (fig. 4).

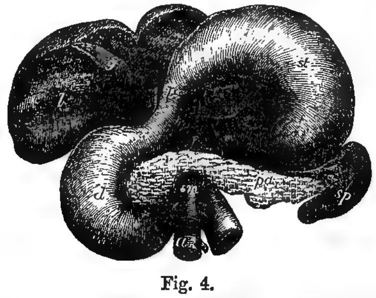


Fig. 4.

**The under surface of the stomach and liver, which are raised to shew the duodenum and pancreas.**

*st*, stomach; *p*, its pyloric end; *l*, liver; *g*, gall-bladder; *d*, duodenum, extending from the pyloric end of the stomach to the front, where the superior mesenteric artery (*sm*) crosses the intestines; *pa*, pancreas; *sp*, spleen; *a*, abdominal aorta.

6. We must now follow the progress of the semi-fluid mass known as the *chyme*, from the stomach into the small intestine, and notice the changes which are collectively impressed upon it, and are known as *chylification* or intestinal digestion. But before we can satisfactorily do this, we must say a few words regarding the intestinal mucous membrane, with its various glands, &c., and on the changes which take place in it during digestion.

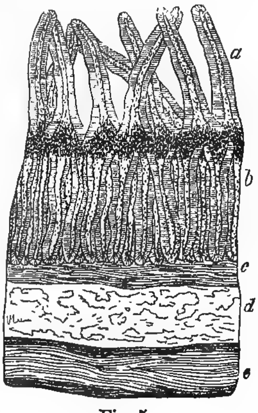


Fig. 5.

**Vertical and longitudinal section of the small intestine in the lower part of the jejunum, shewing the general arrangement of its coats.**

*a*, villi; *b*, intestinal tubes or follicles of Lieberkuhn; *c*, submucous areolar tissue; *d*, circular muscular fibres; *e*, longitudinal muscular fibres.

The mucous membrane of the small intestine resembles that of the stomach in so far as it is of considerable thickness, and consists in a great measure of laterally grouped tubes. The reader is referred to fig. 5, which exhibits a section of the mucous membrane of the small intestine in the dog. These tubes, which form the great mass of the middle portion of the section marked *b*, are commonly called the *follicles of Lieberkuhn*, although they were first described by Brunner. They are straight, nearly uniform in diameter throughout their entire length, and are parallel to one another, and perpendicular to the inner surface of the small intestine on which they open. Nothing is known of the exact nature of their secretion; but in association with the secretions of other glands, they combine to yield the intestinal juice whose characters and uses will shortly come under our notice.

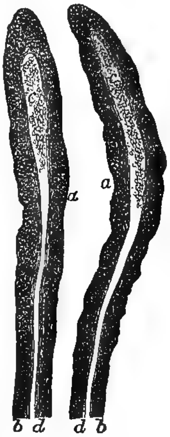


Fig. 6.

**Two villi, denuded of epithelium, with the lacteal vessels in their interior.**

*a*, limitary membrane of the villus; *b*, basis of the same; *c*, dilated blind extremity of the central lacteal; *d*, trunk of the same.

The projecting bodies marked *a* in the figure are termed the *villi;* they are minute processes of the mucous membrane of the small intestine, and obviously serve to increase to a great extent the amount of absorbing mucous membrane. They first appear in the duodenum, where they seem to develop themselves as elongations of the partitions between the cells or pits into which the tubes open. Comparatively scanty in number at first, they become very numerous (covering the whole surface) in the further part of the duodenum and the rest of the small intestines, giving to the mucous membrane a velvet-like or pilous appearance; they finally cease at the ileo-cæcal valve, which forms the boundary between the small and large intestine. In man, they are conical in shape, and measure from $\frac{1}{45}$th to $\frac{1}{60}$th of an inch in length. They vary much in shape and size in the lower mammals and in birds. (In carnivorous animals, as the dog, they are longer and more filiform than in man.)

The structure of a villus (fig. 6) is somewhat complicated, but we must endeavour to explain it, because, without tolerably accurate knowledge on this point, no one can understand how most of the essential elements of food (the albuminates and fatty matters) make their way from the intestine to the blood. Each villus is provided with an abundant set of capillaries, which doubtless absorb fluid matters, which thus find their way directly from the bowels into the blood (fig. 7). A single artery enters its base, and passing up its centre, divides into a capillary plexus, which almost surrounds the villus immediately beneath the mucous membrane. From these arise small veins, which usually pass out of the villus in two, three, or more trunks, and contribute to form the portal vein. See CIRCULATION.

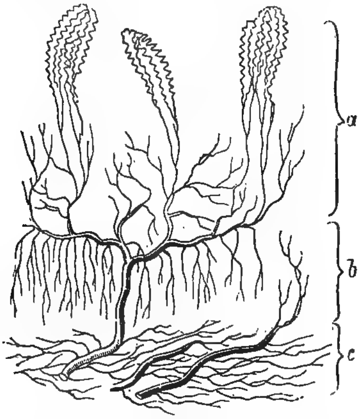


Fig. 7.

**Vertical section of the coats of the small intestine, shewing the capillaries and the beginnings of the portal vein. The arteries are not seen, not having been penetrated by the injection which has been thrown into the portal vein.**

***a*, vessels of the villi; *b*, those of the tubes or follicles of Lieberkuhn; *c*, those of the muscular coat.**

The villus also contains in its interior one or more *lacteals*, which are vessels with club-shaped closed extremities, which absorb the chyle from the intestine. Their milk-white appearance, when they are filled with chyle, suggests the origin of their name. The tissue which occupies the cavity of the villus, in which the lacteals are imbedded, and which supports the capillary plexus, is in a great measure made up of nuclei and granules, except at the free extremity, where a vesicular structure, resembling very minute fat globules, is apparent.

There is abundant evidence that the function of the villi is connected with absorption, and mainly with the absorption of chyle. 1. The villi exist only in the small intestine, where the absorption of food goes chiefly on. 2. They are most developed in that part of the intestine where chyle is first formed. 3. They are turgid, enlarged, and opaque during the process of chylification, and small and shrunken in animals that have been kept fasting for some time before death.

In addition to the villi, the mucous membrane of the small intestine presents numerous transverse folds, which are termed the *valvulæ conniventes*, from their valvular form and from their movements under water resembling the winking motion of the eyelids (fig. 8). Each fold passes round three-fourths or more of the gut; and in the lower part of the duodenum, and in the jejunum (the parts in which they are most fully developed), they are often more than half an inch in depth; further on, they diminish in depth, length, and number, and in the lowest part of the ileum they can scarcely be traced. Their object clearly is to increase the extent of the absorbent mucous membrane.

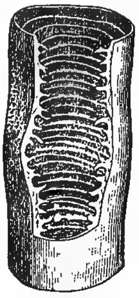


Fig. 8.

**Small intestine distended and hardened by alcohol, and laid open to shew the valvulæ conniventes.**

In addition to Lieberkuhn's follicles or tubes, which exist in the whole of the small intestine, there are other glandular or secreting structures, imbedded in the submucous tissue of certain portions of the intestinal tract, which require consideration. These are: 1. Brunner's glands, which occur only in the duodenum; 2. Solitary glands, which seem to occur in all parts of the intestine, both small and large; and 3. Peyer's glands, which are usually confined to the ileum.

*Brunner's glands* are most abundant at the pyloric end of the duodenum. In structure, they resemble the pancreas, their ultimate elements being bunches of vesicles, from which minute ducts arise, which coalesce and form larger ducts, through which the secretion is poured into the duodenum. It is believed that they secrete a fluid similar to the pancreatic juice. The *solitary glands* occur in all parts of the intestine, but are perhaps more numerous in the jejunum than elsewhere. Each gland is a simple membranous flask-shaped vesicle, the neck corresponding to the surface of the intestine, while the rounded base lies in the submucous tissue. The neck presents no opening, and how the contents, which consist of nuclei and granular particles, are discharged into the intestine, is not clearly known. As we never see them larger than a mustard-seed, we may presume that, on attaining that size, they burst. *Peyer's glands* (fig. 9) are apparently mere aggregations of solitary glands, forming oval patches in the ileum. These patches vary in size and number, being largest towards the cæcum, where their long diameter sometimes measures three or four inches, and smallest towards the jejunum; while their number varies from fifteen to twenty, or even more. Nothing certain is known regarding the uses of these solitary or aggregated glands; but as they

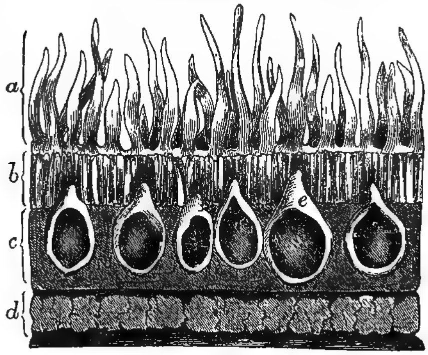


Fig. 9.

**Vertical section through a patch of Peyer's glands in the dog.**

***a*, villi; *b*, tubes of Lieberkuhn; *c*, submucous tissue, with the glands of Peyer imbedded in it; *d*, muscular and peritoneal coats; *e*, apex of one of the glands projecting among the tubes.**

are largest during the digestive process, we must infer that they are in some way connected with that function. Possibly, the peculiar odour of the fæces may be due to their secretion. In typhoid or enteric fever, and in phthisis, these glands become ulcerated, which probably occasions the diarrhœa so common in these diseases.

Brunner's glands are much more developed in the herbivora than in the carnivora; Peyer's, on the other hand, are most developed in the latter.

We have endeavoured, in the preceding sentences, to give the reader some idea of the complicated structure of the mucous and submucous coat of the small intestines; we now proceed to notice the chief uses of the muscular coat of the intestine. This coat, as has been already mentioned, consists of two layers of muscular fibres—namely, circular and longitudinal fibres, of which the former lie next to the submucous coat. The peristaltic or vermicular action by which the substances which enter the duodenum from the stomach are moved onwards, is due to this muscular coat. A person who has once seen the abdomen of an animal laid open immediately after death, will have a better idea of the nature of this movement than can be afforded by any description. It commences about the pyloric third of the stomach, from whence successive wave-like movements are propagated through the entire length of the intestinal canal. It is the rapid succession of these alternate contractions and relaxations that impels the intestinal contents onwards, and occasion those movements which, from their resemblance to the writhings of a worm, have been termed *vermicular*. It is very probable that the rapidity of this movement varies in different individuals—those persons, for example, whose bowels act twice daily having a more rapid vermicular motion than those in whom the act of defæcation occurs only once in the twenty-four hours.

We have now to consider the effects produced on the chyme by the different fluids with which it becomes mixed in the small intestine. These fluids are: 1. The bile; 2. The pancreatic juice; and, 3. The intestinal juice.

The bile (see BILE) is a faintly alkaline or neutral fluid, containing two essential constituents, one of which is of a resinous nature, while the other is a pigment. The resinous constituent is not precisely identical in all kinds of bile, but it generally consists of a soda-salt whose acid is either glyco-cholic or tauro-cholic acid (q. v.), or of a mixture of these salts. Strecker, to whom we are mainly indebted for our knowledge of the chemistry of the bile, states that in most mammals the resinous constituent merely differs in the varying proportions in which the taurocholates and glycocholates are intermixed, the former usually preponderating. According to Lehmann, the resinous constituent amounts to at least 75 per cent. of the solid residue. The bile-pigment occurs in the bile of different animals under two forms—namely, as a brown and as a green pigment, the latter probably only differing from the former in being more highly oxidised. There has never been a case in which physiologists have had an opportunity of directly observing the quantity of bile that is secreted by the human subject, and all our information on this subject is derived from observations on animals, in which the *ductus choledochus communis* (see LIVER) has been tied, and a fistulous opening established into the gall-bladder. If the same proportion of bile to bodily weight holds good in man as in the dog, a man weighing ten stone would secrete daily about five pounds of bile. All observers agree, that the amount of the biliary secretion varies directly with the quantity of food; and as animals with biliary fistulæ (in whom all the bile escapes externally, instead of making its way into the duodenum) usually have voracious appetites, experiments on this point are easily made. There is great discrepancy of opinion as to how soon after a meal the bile flows most abundantly into the intestine. According to Kölliker and Müller, whose experiments were made on dogs fed only once a day, very little bile is secreted in the first and second hour after a meal; more in the third, fourth, and fifth; the maximum being sometimes attained in the fifth, sometimes not till the eighth hour.

Numerous and somewhat discrepant views have at different times been advanced regarding the functions of this fluid; we shall here only notice those functions which are connected with digestion. One use that has been ascribed to it, is to neutralise in the small intestine the acid chyme which emerges from the stomach. But the bile can contribute little or nothing to the neutralisation of the free acid, because, in the first place, the bile is very slightly alkaline, and often perfectly neutral; and secondly, because the chyme in the intestine is still acid after the admixture of the bile. Again, the bile has been asserted to possess a special solvent action on the chyme; but none of the ordinary constituents of the latter seem to be essentially changed, even when digested for a long time with fresh bile. Again, much importance has been attached to the antiseptic action of the bile on the contents of the intestinal canal, in favour of which view it is alleged that when no bile is poured into the intestine, the fæces have a putrid odour, as is sometimes observed in patients with jaundice, and as was noticed by Frerichs in animals in which the *ductus choledochus* had been tied. Another use that has been assigned to the bile is, that it exerts a stimulating action on the intestinal walls, and thus acts as a natural purgative; and in support of this view, it may be mentioned that jaundice (in which the bile does not flow into the intestine) is often accompanied by extreme constipation, and that purified ox-gall, taken either in the form of pill or enema, produces an undoubted purgative action. But the main use of the bile seems to be to promote the digestion of fatty matters, and it accomplishes this end not so much by any solvent chemical action on the fats (which at most is extremely slight), as by a peculiar physical action both on the fats and on the intestinal walls, disintegrating the former, and impressing on the latter (by moistening the villi) a peculiar condition which singularly facilitates the absorption of fatty matters. This view is fully confirmed both by direct experiments out of the body, and by comparing the relative qualities of fat that are retained in the body and applied to the purposes of life by animals with biliary fistulous openings, and by healthy animals.

The pancreatic fluid which is poured into the duodenum at the same spot with the bile (see fig. 1), is a colourless, clear, somewhat viscid and ropy fluid, devoid of any special odour, and exhibiting a strong alkaline reaction. This fluid, as yielded by different dogs with permanent fistulous openings, varies considerably in chemical composition; the collective solid constituents ranging from 1·5 to 2·3 per cent., the organic matters from 0·9 to 1·6, and the mineral matters from 0·62 to 0·75.

The most abundant and important of the solid constituents is a peculiar substance termed *pancreatine*, or pancreatic diastase or ferment, in combination with soda, to which this fluid owes its principal chemical and physiological properties. Calculating from the quantity of pancreatic juice secreted by dogs of known weight, we may infer that a man weighing ten stone secretes daily about ten pounds of this fluid.

One of the chief uses of the pancreatic juice in relation to digestion, is to convert into sugar the amylaceous or starchy matters which have escaped the action of the saliva, and have passed unchanged into the duodenum. It possesses this property in a far higher degree than the saliva; and, as might be expected in reference to this use, the pancreas is found to be much more developed in herbivorous than in carnivorous animals. Bernard, the representative of the modern school of physiology in France, claims for this fluid another important function; he believes that he has proved that it is solely by the action of this secretion that the fat is reduced to a condition in which it can be absorbed and digested; that is to say, that it is decomposed into glycerine and a fatty acid. See Fats. This view has, however, not been generally accepted, and it seems probable that although the change described by Bernard takes place when fat and pancreatic juice are simply mixed together in a test-tube, it does not actually take place in the intestine, the acid gastric juice probably acting as an interfering agent. An attempt has lately been made by Corvisart and Meissner to prove that, like the gastric juice, this fluid can dissolve albuminous matters; but this view cannot be substantiated. Considering the large quantity of pancreatic fluid which is yielded in 24 hours, Schmidt, who has made the digestive juices the subject of his special study, is of opinion that the function of this fluid is not so much to promote the conversion of starch into sugar, as for the purpose of diluting the chyme, and for reconverting the soda (which in the pancreas has been separated from the chlorine of the chloride of sodium, and has combined with the pancreatine) into chloride of sodium. He shews, from numerical calculations, that more than half of the chloride of sodium existing in the blood which circulates through the pancreas, is broken up into hydrochloric acid and soda, of which the former is separated by the gastric glands, while the latter unites with the pancreatine. Meeting again in the duodenum, the hydrochloric acid and the soda reunite, and re-form chloride of sodium, which is again absorbed, and re-enters the circulation. This is perhaps one of the most singular decompositions and reunions occurring in the animal body.

Of the last of the fluids poured into the intestine, and co-operating in the digestive process, the *intestinal juice*, we know comparatively little. It is the aggregate secretion of the various glands which we have described as occurring in the walls of the small intestine. It is a colourless, or sometimes yellowish, ropy, viscid fluid, which is invariably alkaline. We are not aware of any special or characteristic constituent in it, such as occurs in the other chylopoietic fluids. Its daily quantity is probably nine or ten ounces. It seems to unite in itself the leading properties of the pancreatic and gastric juices; that is to say, it resembles the former in converting starch into sugar, and the latter in dissolving flesh and other albuminous bodies.

We shall conclude this part of the subject with a few remarks on the chemical composition of the contents of the small intestine. On laying open the gut, we usually find a semi-solid admixture of imperfectly digested and indigestible substances and of the constituents of the digestive fluids in a more or less changed condition. The reaction of this mass varies in different parts of the canal, and in some measure with the nature of the food. Thus, the contents of the stomach always redden litmus paper, whatever kind of food has been taken; the duodenal contents are also always acid, but in a far less intense degree; in the jejunum we meet with only a faint acid reaction, which altogether disappears in the ileum; while in the cæcum, and sometimes in the lower part of the ileum, an alkaline reaction occurs. After a purely flesh diet the acid reaction disappears shortly below the duodenum, while after the sole use of vegetable food, it may sometimes be traced even to the cæcum. As a general rule, the contents of the large intestine are alkaline.

In consequence of the rapid absorption that goes on along the intestinal surface, we meet with a comparatively small amount of soluble matters in these contents. Among these soluble matters we often find glycose (or grape-sugar), which seems to owe its origin to the metamorphosis of starch, and not to sugar having been present in the food; for after saccharine food has been taken, we rarely meet with it in any quantity in the small intestine, its absorption taking place with great rapidity. In the alcoholic extract of these contents we can almost always find evidence of the presence of biliary constituents. In the duodenum, and for a little way beyond it, we find glyco-cholic and tauro-cholic acid; descending a little further, they rapidly diminish, till we find the products of their disintegration; while in the large intestine, little more than a trace of these products can be detected. These chemical observations confirm the experiments of Schmidt, which shew that nearly half the bile which is poured into the duodenum is decomposed before it reaches the middle of the small intestine.

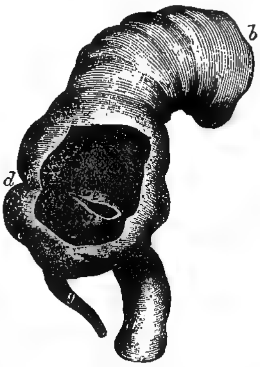


Fig. 10.

Cæcum inflated, dried, and opened to shew the arrangement of the valve.

*a*, termination of the ileum; *b*, ascending colon; *c*, cæcum; *d*, a transverse construction projecting into the cæcum; *ef*, lips of the valve separating the small from the large intestine; *g*, the vermiform appendix of the cæcum.

7. We have now arrived at the seventh stage of the digestive process, that of *defæcation*. The line of demarcation between the small and large intestine is very obvious, and by the peculiar arrangement of the ileo-cæcal valve (see fig. 10), matters are allowed to pass forward with facility, while regurgitation is impossible. For anatomical details regarding the large intestine, we may refer to the articles Alimentary Canal, Cæcum, and Colon. The contents of the large intestine differ very materially from those which we have been considering in the last paragraph, and constitute the fæces. They are more solid and homogeneous, and are often moulded into a definite shape by the cells of the colon. The only essential change which the contents undergo in this part of their course is, that they increase as they pass onward in solidity, in consequence of the absorption of fluid from them by the mucous membrane. They are propelled forward into the rectum by the vermicular action which has been already described. Here they accumulate, being prevented from escaping by the contraction of the sphincter muscle—a band of strong muscular fibres surrounding and closing the gut at its lower extremity. The act of defæcation, or of expulsion of the fæces from the rectum, is effected partly by the muscular fibres of that part of the intestine which are stimulated to

contraction by a certain degree of distension, and which are to a certain extent under the influence of the will, and partly by the simultaneous contractions of the abdominal muscles and of the diaphragm, which, by reducing the antero-posterior and transverse diameters of the abdominal cavity, compress the intestinal canal in such a manner as greatly to assist the expulsive action of the rectum. These forces, or some of them (for usually the detrusive action of the muscular fibres of the rectum is sufficient), overcome the passive contraction of the sphincter, and the act of defæcation is the result.

The fæces consist of a mixture composed of undigested particles of food (such as vegetable cellular tissue, fragments of tendon, skin, and half-digested muscular fibre), of epithelium and mucus (derived from the intestinal walls), and of traces of decomposed biliary matters. Their peculiar odour is ascribed by some to the secretion of Peyer's glands, and by others to decomposed bile; while Liebig refers it to a decomposition of albuminous matters, founding his view upon the fact, that by burning albumen with potash, he could manufacture in the laboratory odours of a fæcal character. The last is the least probable view. Their colour varies with the food. On a mixed diet, they are of a yellowish-brown tint; on a flesh diet, much darker; and on a milk diet, quite yellow—and they become darker on exposure to the air. Their reaction is most commonly but not invariably alkaline. Their daily quantity is very variable; the mean of 17 observations made by a German physiologist, Wehsarg, was about 4·6 ounces, of which very nearly one ounce was solid matter, the rest being water; the largest and the smallest quantities being ten, and rather more than two ounces. Liebig, many years ago, made the observation that the insoluble salts of the food are mainly carried off by the fæces, while the soluble salts are for the most part eliminated by the urine. For further details on the chemistry of this subject, we must refer to the elaborate Memoirs of Dr Marcet, published in the *Philosophical Transactions.*

8. The absorption of the chyle forms the completion of the digestive act. The coats of the intestines contain two perfectly distinct sets of vessels—one through which blood circulates, and the other containing a milky or transparent fluid, chyle or lymph, which, after a somewhat circuitous route, is poured into the blood. We have already referred to the fact, that fluids are absorbed from the stomach and intestine by the veins and capillaries of the mucous membrane; we now proceed to notice the mode in which the vessels of the second kind, the lacteals, act as absorbing agents. The lacteals are merely a portion of the great lymphatic system of the body, which will be described in a future article. See LYMPHATICS. They commence, as has been previously mentioned, in the villi, and possibly also in the intervening mucous membrane; and when an animal is killed while the digestive process is going on, they have, in consequence of their being distended with chyle, the peculiar white or milky appearance which procured for them their name of *vasa lactea*, from their discoverer, Asellius, in 1622. They pass in great numbers, and in a reticulated arrangement, between the layers of the mesentery, the portion of Peritoneum (q. v.) which surrounds the gut, and retains it in its proper position. After passing through the mesenteric glands, where their contents seem to become more highly organised, they make their way to the right side of the aorta in the lumbar region, where they finally discharge themselves into an elongated pouch, termed the *receptaculum chyli*. From this pouch, the thoracic duct, containing the chyle, passes upward along the vertebral column till it reaches the level of the arch of the aorta, behind which it runs to the left side, and discharges its contents into the subclavian vein, close to its origin with the internal jugular, its orifice being protected by two valves. The nature of these contents has been already described in the article CHYLE. This chyle is, in reality, incipient blood, which has been formed, as we have already seen, from the food, and has been absorbed from the intestine by the lacteals. We have now traced it to its entrance into the general circulation, and it only remains for it to pass, in conjunction with the venous blood with which it is mixed, through the lungs, in order to be converted into new and perfect arterial blood, fit for the highest processes of organisation.

We shall conclude this article with a notice of some of the most striking peculiarities presented by the digestive organs in the lower animals.

In the mammalia, we have three different forms of stomach—the *simple*, the *complex*, and the *compound*. In the *simple* form, the organ consists of a single cavity, as in man, but the form may vary to a great extent. It is most simple and relatively smallest in carnivorous animals. This is the most common form of mammalian stomach. In the *complex* stomach, that viscus is made up of two or more compartments communicating with one another, but often without presenting any marked difference of structure. The kangaroo, the porcupine, and the squirrel, afford good examples of this form of stomach. In the cetacea, the stomach consists of from five to seven cavities, that communicate with each other; but whether their functions are similar or different is not known. The *compound* stomach occurs in the ruminants (the cow, sheep, camel, &c.); it consists of four distinct cavities, differing very materially in their size, and in the arrangement and structure of the lining mucous membrane (see fig. 11). The first, and by far the largest cavity, is the paunch or *rumen*, *b;* it occupies a great part of the abdominal cavity, and is the receptacle into which the food is received when first swallowed. The second cavity is termed (from the peculiar

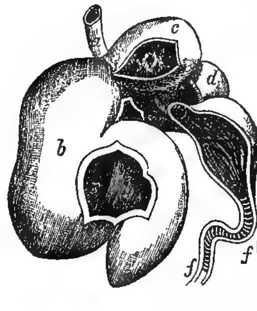


Fig. 11.

**Compound stomach of ox.**

*a*, œsophagus; *b*, rumen, or paunch; *c*, reticulum, or second stomach; *d*, omasum, or third stomach; *e*, abomasum, or fourth stomach; *f*, the duodenum.

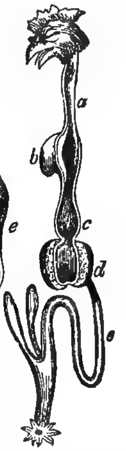


Fig. 12.

**Alimentary canal of fowl.**

*a*, œsophagus; *b*, crop; *c*, proventriculus, or secreting stomach; *d*, gizzard, or triturating stomach; *e*, intestinal canal; *f*, two long cæcal tubes indicating the theoretical commencement of large intestine.

arrangement of the lining membrane, which forms deep polygonal cells) the honey-comb or *reticulum*, *c*. The third cavity presents a foliated appearance internally, and is hence popularly known as the manyplies, *d*. In anatomical works, it is sometimes termed the *psalterium*, and sometimes the *omasum*. The fourth division, termed the reed or *abomasum*, *e*, is somewhat of a pyriform shape, and is the true digestive stomach, in which alone gastric juice is secreted, all the preceding cavities being merely for the purpose of preparing the food for the more essential changes which it is here destined to undergo. The food first passes in a crude unmasticated state into the paunch, which, like the crop of birds which we shall presently notice, serves as a receptacle for the food until the act of feeding is concluded, and moistens it with the fluid secreted from its walls. The water, however, which the animal drinks, seems to pass directly into the second stomach. During rumination, small portions of the food pass from the paunch into this second stomach, from whence they are returned, in the form of pellets, to the mouth, where they undergo thorough mastication, and are then returned, as a pulp, by the œsophagus directly into the third stomach. The direction of the food into one or other of these cavities is altogether independent of the will, and results from a peculiar arrangement and property of the lower end of the œsophagus, which does not terminate at its opening into the paunch on one side, and the second stomach on the other, but is continued onwards as a deep groove or semi-canal, with two lips. If these lips come in contact, they form a perfect canal, leading directly to the third stomach; while if they remain open, the food passes into the first or second stomach. The dry food first swallowed opens the lips and escapes into the paunch, while the masticated food, being soft and pulpy, passes along the groove, without opening its lips, into the third stomach. Here it is diffused over a large surface of mucous membrane, and doubtless undergoes certain changes before entering the fourth or true stomach. In the camel, the dromedary, and the llama, numerous rows of large quadrangular deep water-cells are developed on the parietes of the second stomach, and on the part of the paunch next to that cavity. These cells are surrounded by muscular fibres, which, by their contraction, exclude the food from their interior, and by their gradual opening, the water is allowed to mix in successive small quantities with the food. It is by this arrangement that these animals only require to drink at comparatively long intervals. The intestinal canal of the ruminants is of great length, being sometimes, as in the sheep, more than thirty times the length of the body of the animal; and in herbivorous animals generally, as compared with carnivorous, the canal is very long.

It is in the large intestine that, next to the stomach, we find most varieties of structure. Cuvier has given the following *résumé* of the principal facts connected with this subject, to which, however, there are numerous exceptions. 1. In man, the orangs, and the wombats, there are both cæcum and vermiform appendix. 2. In the other quadrumana, the digitate carnivora, the marsupiata, the rodentia, the pachydermata, the ruminantia, the solipeds, and the amphibious mammals, there is a cæcum (often in vegetable-feeders larger than the stomach, and probably subservient to the digestive process), but no vermiform appendix. 3. In the edentata, the plantigrade carnivora, and the cetacea, there is neither cæcum nor vermiform appendix.

In birds, as in all other classes of animals, the alimentary canal varies according to the nature of the food, being long and capacious, and in some parts highly muscular, in the granivorous tribes, while it is much more simple in those which live on fish and other animal food. We take the common fowl as a good example of the former class (see fig. 12). The œsophagus, about the middle of its course, and a little above the union of the clavicles (the furculum), presents an enlargement termed the crop or *ingluvies*, which varies in form and structure according to the food, and is provided with numerous glandular follicles. Just before terminating in the gizzard, the œsophagus again dilates to form a second but smaller cavity, known as the glandular stomach, *proventriculus*, or *ventriculus succenturiatus*, *c*, from whence a copious secretion of gastric juice is poured out and mixed with the food, which, having previously been macerated by the secretion of the crop, now passes on to the gizzard, *d*, which is a muscular organ of immense strength, which grinds and crushes whatever is placed in its central cavity—a process that is facilitated by the presence of hard pebbles, which are instinctively swallowed by the bird, and act the part of millstones. There is no very marked division in birds between the large and small intestine, the theoretical limit being indicated by the presence of two (sometimes only one) cæcal appendages, *f*.

There are no special points that we need notice regarding the digestive organs of reptiles, except that as the ophidians (serpents) and saurians (lizards) are mostly carnivorous, and most of the chelonians (tortoises) are herbivorous, the apparatus in question is more simple in the former than in the latter.

The amphibia afford us an excellent illustration of the close connection between the nature of the food and the development of the intestinal canal. In the young tadpole of the common frog, which lives upon the soft vegetable matter of our fresh-water ponds and ditches, the stomach is narrow and elongated, and the intestine is of extraordinary length, and of nearly equal diameter throughout, being coiled up in a spiral manner, and distending the capacious abdomen. As the tadpole becomes metamorphosed into a frog, it changes its vegetable food for slugs, worms, grubs, flies, &c., and, at the same time, the alimentary canal becomes very much shortened, and its divisions into stomach, &c., more distinctly marked.

In osseous fishes, the alimentary canal is generally shorter and more simple than in the higher vertebrata, in many—as, for example, the herring—being shorter than the body, and, excepting the stomach, running in nearly a straight line through it. In the cartilaginous fishes, as the sharks, rays, &c., a spiral valve winds in close turns from the pyloric to the anal extremity, leaving merely a small central aperture, along which the contents slowly progress. By this singular arrangement, the intestine, although short in proportion to the length of the animal, presents an enormous absorbing surface.

The limits within which we must confine this article, preclude us from noticing the various modifications which the digestive organs present in the various departments of the invertebrate animals; and we shall conclude with a few remarks upon the mode in which digestion is carried on in some of the lowest and simplest animals. The *hydra* or fresh-water polype is a minute animal, consisting of nothing but a bag or stomach, with tentacles surrounding its single orifice. The animalcules, &c., which the hydra catches by these lasso-like tentacles (see HYDRA), are drawn into the interior, where they are digested, and applied to the nutrition of the organism, the insoluble portions being rejected by the aperture through which they entered. In the *actinophrys sol*, or sun-animalcule, there is no persistent aperture;

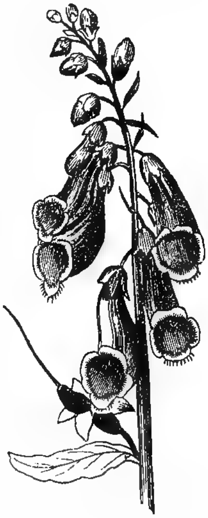
but when its radiating filaments—from which it derives its name—have secured a particle of organised matter fit for its nourishment, they twist over it, compress it against the globular body, which first yields, and becomes concave at the point, and finally closes over it, the prey being distinctly visible in the interior. This astomatous animalcule can thus form a mouth and stomach when it requires them. The indigestible remains are ejected by a corresponding reversed process. The *amœba* or *sponge-proteus* neither has a mouth and stomach, nor can it construct these organs: it simply folds itself around the solid particles from which it derives its nourishment, and imbibes their nutritious fluids through its cell-wall. We might adduce various other examples of animals devoid of a stomach, but we have brought forward sufficient evidence to shew that the old doctrine, that this organ is a necessary constituent of an animal, cannot be sustained, when we approach that debatable-land which separates the two great organised kingdoms of nature.

**DIGGING.** The operation of digging is performed with a spade or pronged fork. The spade or fork is thrust in with the foot, and the mass of earth is first loosened by the lever-power of the handle, then lifted and inverted. When this operation is performed in spring or summer, the ground should be dry, so as to obtain pulverisation as easily and to as great extent as possible. In stronger soils, which are dug in autumn, a little moisture is desirable, as the land lies fallow, and the frosts of winter afterwards pulverise and reduce it to a proper degree for receiving the crops in spring. Digging is almost entirely confined to the cultivation of gardens, for though a most efficient means of cultivating the soil, it is too expensive for field-crops. It is almost always resorted to, however, in this country for digging over or trenching land which has been in timber, or full of stones or boulders. Until recently, the spade was the only implement used for digging in gardens, but steel forks are coming rapidly into use, being lighter and more easily driven into the soil. Besides preparing the land for plants, the spade and the fork, chiefly the latter, are used for taking crops, such as potatoes and carrots, out of the ground.

**DI'GIT** (Lat. *digitus*, the finger), a term applied to the ten symbols of number, 0, 1, 2, &c. to 9; thus, 305 is said to be a number of three digits. Numbers were originally indicated by the fingers, and hence the name. Astronomers use digit to signify a twelfth-part of the diameter of the sun or moon, and speak of an eclipse of seven digits, meaning that seven-twelfths of the diameter is covered.

**DIGITA'LINE** is an active principle present in *Digitalis purpurea*, or foxglove.

**DIGITA'LIS**, a genus of plants of the natural order *Scrophulariaceæ*, natives chiefly of the south of Europe and temperate parts of Asia. One only, the common Foxglove (*D. purpurea*), is a native of Britain, and is very abundant in some parts of the country, its large purple flowers often giving a gay appearance to dry banks and steep hills. It is not unfrequently admitted into flower-gardens, particularly a white-flowered variety. Its English name, and the botanical name D. (Lat. *digitale*, the finger of a glove), both refer to the form of its flowers. The central and southern parts of Europe produce several species with yellow flowers, one of which, *D. grandiflora*, is not an uncommon ornament of gardens. *D. purpurea* is much valued in medicine. It was first brought into repute by Dr Withering. Its leaves and seeds are the parts used, generally the former. They are narcotic and poisonous. The leaves have a disagreeable smell when fresh, and a bitter nauseous taste, and are violently emetic and cathartic; but when dried and administered in small and repeated doses, they are diuretic, and therefore sometimes useful in dropsy; and are still more valuable on account of their sedative power over the action of the heart and the circulation of the blood, and are used in diseases of the heart, aneurisms, hæmorrhages, &c. They appear also to possess some peculiar power over the brain and nervous system, and have been employed in insanity, epilepsy, and other diseases. They are administered generally in the form either of tincture or infusion. They ought to be collected before the flowers expand. They owe their active properties to a peculiar crystalline principle, called *Digitaline* (q. v.). The use of D. as a medicine requires great caution on account of a property which it possesses—very remarkable in a vegetable medicine—of cumulative action on the system. Many, if not all of the species of D. appear to possess similar properties with *D. purpurea*, and to be capable of being substituted for it.



Digitalis Purpurea.

**DIGITA'RIA.** See Millet.

**DIGITIGRA'DA** (Lat. finger-walking), in the zoological system of Cuvier, one of the tribes of the *Carnivora* (q. v.), distinguished by walking on the toes alone, the heel not touching the ground. Among the digitigrade quadrupeds are included the most carnivorous of the *Carnivora*, the feline and canine families, hyænas, civets, weasels, &c. The Weasel family (*Mustelidæ*), however, forms a connecting link, in respect to the character derived from the mode of walking, between the tribe D. and the tribe *Plantigrada* (q. v.), being, in fact, semi-plantigrade, and not walking on the mere tips of the toes, like the other digitigrada.

**DIGNE** (Lat. *Dinia*), a town in the department of the Basses-Alpes, on the Bléonne, 60 miles north-east of Marseille, occupies a picturesque situation upon a mountain slope, and is encircled by walls, but its streets are narrow, crooked, and steep, and the houses mean and squalid. Its chief building is the Préfecture, once the bishop's palace, a very ordinary edifice. The principal manufactures of D. are articles of leather, and it has a trade in dried fruits, honey, wax, woollen and linen cloth, kid-skins, &c. In the neighbourhood of D. there are several hot saline springs, temperature 104° F. Pop. 3720. Of Dinia, which is mentioned by Pliny, nothing remains. It is known that it embraced Christianity at an early period, and has given title to a bishop since the year 340. In the year 1629, a plague reduced the population of D. from 10,000 to 1500.

**DI'HONG**, or **SANPO'**, the largest feeder of the Brahmaputra, rises on the north side of the Himalayas, near the sources of the Sutlej and the Indus, in lat. 30° 25′ N., and long. 82° 5′ E., and bursts through that great mountain-chain near lat. 28° 15′ N., and long. 95° 10′ E., having pursued through Tibet an easterly course of about 1000 miles. Finally, it joins the more easterly branch of the Brahmaputra, near the north-east angle of Assam.

**DIJON**, a town of France, in the department of Côte d'Or, formerly capital of the old duchy of Burgundy, in lat. 47° 20′ N., and long. 5° 2′ E., and about 195 miles south-east of Paris by railway. D. occupies a most delightful situation in a fertile plain on the right bank of the Ouche, and at the base of the vine-clad hills which produce the famous Burgundy wines. The environs are exceedingly beautiful. D. is surrounded by lofty walls, pierced for five gates, and the ramparts being tastefully planted with fine trees, furnish very agreeable promenades. The town is for the most part well and regularly built, and the streets spacious and clean. Among the public buildings, which are numerous and imposing, the chief are the cathedral, a massive Gothic structure, dating from the 13th c., with a tall wooden spire, above 300 feet high; the church of Notre Dame, a noble specimen of the purest Gothic architecture; the church of St Michael, with a splendid renaissance front; the theatre, a handsome building, with a fine Corinthian portico; and the palace of the Dukes of Burgundy, now used as the town-hall, and much modernised externally, but possessing interiorly some of its earlier features, and containing a museum very rich in monuments of the middle ages, besides a library of 40,000 volumes, and several hundreds of manuscripts. D. is also the seat of a university academy with three faculties—law, science, and letters—and possesses, in addition, a royal college, a theological seminary, a botanic garden, and an academy of art. The manufactures of D. consist of woollen cloth, blankets, hosiery, leather, vinegar, chemical products, &c.; and there are also salt refineries, distilleries, and breweries; but the town is mainly dependent on its trade in the wines of Burgundy. Pop. 28,567. D. dates from Roman times, its ancient name being *Dibio*. It came into the possession of the Burgundians in the 5th c., and from them passed to the Franks. In the 9th c., it was ruled by counts of its own, under the suzerainty of the bishops of Langres. In the 11th c., it was united to the duchy of Burgundy, of which it became the capital, and the usual residence of the dukes, who rebuilt and greatly enlarged and improved it. D. has thirty establishments engaged in the manufacture of the Liqueur de Cassis, a beverage prepared from the black-currant, and of which, in 1859, it produced 220,000 gallons.

**DILAPIDA'TION**, in English law, is where an incumbent suffers his parsonage-house or outhouses to fall down, or be in decay, for want of necessary reparation; or pulls down or destroys any of the outhouses or buildings belonging to his living; or destroys woods, trees, &c.; for it is said to extend to committing or suffering any wilful waste on the inheritance of the church.—Stephens's *Eccl. Law.* Dilapidation is a species of the legal injury known as Waste (q. v.). A rector or vicar is bound to keep his residence and the chancel of the church in repair, but not to supply or maintain anything in the way of ornament, as painting, white-washing, or papering. An ecclesiastical person suffering the church-property to get out of repair, is subject to an action for dilapidation at the instance of his successor (13 Eliz. c. 10, s. 2); and by 14 Eliz. c. 11, s. 18, the money so recovered must be applied to the repairs. By 5 and 6 Vict. c. 108, s. 19, being an act to empower ecclesiastical corporations to grant long leases, it is provided that the incumbent shall not be liable for dilapidation occurring during such leases.

**DI'LATORY PLEAS.** See PLEA.

**DILE'MMA.** A true dilemma is defined by Whately as 'a conditional syllogism with two or more antecedents in the major, and a disjunctive minor.' The following dilemma, of the kind called destructive, will perhaps convey a clearer notion than any definition. 'If this man were wise, he would not speak irreverently of Scripture in jest; and if he were good, he would not do so in earnest; but he does it, either in jest or earnest; therefore, he is either not wise, or not good.' There being two conclusions, one or other of which your opponent must admit, he is in a manner caught between them; hence we speak of the *horns* of a dilemma.

**DILETTA'NTÉ** (pl. *dilettanti*, Ital.), in its original sense, is synonymous with an *amateur*, or lover of the fine arts. It is often used as a term of reproach, to signify an amateur whose taste lies in the direction of what is trivial and vulgar, or of a critic or connoisseur whose knowledge is mere affectation and pretence. It is sometimes assumed, in a spirit of self-depreciation, by those who are unwilling that their critical acquirements, or artistic productions, should be judged by the rules which would be applied to those of persons who had made a professional study of art. It was in this sense that it was assumed by the Dilettanti Society (q. v.).

**DILETTANTI SOCIETY**, a body of noblemen and gentlemen by whose exertions the study of antique art in England has been largely promoted. The Society was founded in 1734, and held its meetings at the Thatched House Tavern in St James's Street. It was in its beginnings simply an amateur club, its object being to combine social and friendly intercourse with the cultivation of artistic knowledge and the gratification of artistic tastes. But its funds having accumulated to a large amount, its members resolved, in 1764, to fit out an expedition for the purpose of collecting details and drawings of the most remarkable artistic monuments of antiquity. The persons selected for carrying out this important undertaking were Mr Chandler of Magdalen College, Oxford, the editor of the *Marmora Oxoniensis;* Mr Revett and Mr Stewart, the authors of the magnificent work on Athenian Antiquities; and Mr Pars, a talented young artist. Having spent two years in Greece, they returned in 1766, bringing with them the materials for the two splendid volumes on the Antiquities of Ionia, which were published at the expense of the Society. Architecture had been the first object of their inquiries, but their attention was now turned to sculpture, which was then at the lowest ebb in England. A series of the finest antique statues, bas-reliefs, and busts, were selected and engraved with the greatest care. This work appeared in 1809, with dissertations by Payne Knight. In 1811, a second architectural exploring-party was despatched by the Society to Asia Minor, consisting of Mr (afterwards Sir William) Gell, Mr Bedford, and Mr Gandy. Two volumes were issued, one in 1817, entitled *The Unedited Antiquities of Attica*, and a second on *Antique Sculpture* in 1835. For these spirited exertions in their behalf, the public have been indebted to a club of some sixty private gentlemen.

**DI'LIGENCE**, in the Law of Scotland, is a term used in various significations. 1. It means the care incumbent on the parties to a contract with regard to the preservation of the subject matter. 2. The warrants issued by courts for enforcing the attendance of witnesses and the production of writings. 3. The process of law by which person, lands, or effects are attached either on Execution (q. v.) or in security for debt. In the second of these senses, it corresponds to the English *subpœna;* and in the third, generally to execution. The first can scarcely be regarded as a technical meaning.

**DILIGENCE**, the name given in France to a public conveyance of the nature of a stage-coach. It is a huge strong built vehicle, with four broad wheels, weighing about five tons, and is drawn by four stout horses, at the rate of about six miles an hour. It consists of three chief compartments: the front, called the *coupé*, for three persons; the second, called the *intérieur*, for six persons; and, lastly, the *rotonde*, entered from behind, for six persons. Aloft, in front, is the *banquette*, where the *conducteur* is seated; and behind this, underneath a thick leather covering, passengers are sometimes huddled among luggage and goods, with little regard to their comfort. All the places in the body of the vehicle are numbered, and assigned in the order of booking. Usually, an effort is made to be booked early, in order to secure corner-places. In booking, it is customary to pay only a portion of the fare, called *arrhes;* the remainder being paid at the end of the journey. For the arrhes, a receipt or bulletin ought to be given. Without this security, a traveller may be put down half-way and cheated out of his fare, or he may be compelled to pay over again. The driver being concerned only with the horses, the entire management of the vehicle, including the charge of the drag or break, devolves on the conducteur, a trustworthy but most dictatorial personage, dressed in a blue cloth jacket and cap, and having a badge on his breast indicative of his dignity. The greater number of the diligences in France belong to two companies in Paris—the *Messageries Impériales* and the *Messageries Générales.* The system of diligences, however, has been latterly much broken up by railway transit.

**DILL** (*Anethum*), a genus of plants of the natural order *Umbelliferæ*, having compound umbels without general or partial involucres, the border of the calyx minute but 5-toothed, yellow involute petals, and dorsally compressed lenticular fruit. The COMMON D. (*A. graveolens*) is an annual or biennial plant, which grows wild in cornfields in the East and in the countries around the Mediterranean, but is quite hardy in Britain. It has from a very early period been in general cultivation as an aromatic, stimulant, and carminative. It has a stem 1—4 feet high, bearing at top a flat umbel of 10—30 rays; the leaves much divided, and the final segments thread-like. It has a strong peculiar aromatic smell and taste; the leaves are sometimes used for flavouring pickles, sauces, &c. The fruit (*Dill seed*) is used in medicine, chiefly for relief of flatulence and griping in infants, and is administered in the form of *Dill Water*, in the preparation of which *Oil of Dill* is employed; a pale-yellow essential oil, on which the properties of the plant depend, and which is obtained by distillation.—SOWA D. (*A. Sowa*) is a native of Bengal, and is much cultivated in the East Indies for its fruit, which is variously used in medicine and flavouring. It is a common ingredient in curries. The plant much resembles Common D., but its flavour is stronger.

**DILLENIA'CEÆ**, a natural order of exogenous plants, consisting chiefly of trees, shrubs, or half-shrubby plants, natives of tropical and subtropical regions, allied to the natural order *Ranunculaceæ* (q. v.), but very different in general habit, and also to *Magnoliaceæ*, which in habit they more resemble. They have usually alternate leathery leaves, without stipules. The flowers are sometimes solitary, sometimes in racemes or panicles; the calyx of 5 persistent sepals; the corolla of 5 deciduous petals. The stamens are numerous. The fruit consists of 2—5 distinct or coherent, dry or succulent, carpels. The seeds have an aril. Astringency is a general property of the order; and a number of species are used as vulneraries and for other medicinal purposes in their native countries. Some species of *Dillenia* are large trees, and afford excellent timber. The young calyces of *D. scabrella* and *D. speciosa* have a pleasant acid taste, and are used in curries, and the fruit of *D. speciosa*, although very acid, is eaten with sugar; the juice, mixed with water, is employed in India as a cooling beverage in fevers. The fruit of *D. elliptica* is used to make a sauce for fish in Amboyna. Many of the plants of this order are remarkable for the magnificence both of their foliage and their flowers. It contains about 200 known species.

**DILMA'N**, a town of Northern Persia, in the province of Azerbijan, 50 miles north-north-west of Urumiyah, and 10 miles west of the northern extremity of the lake of that name. It is of considerable extent, has clean streets, and is surrounded by gardens and orchards. D. is a new town, the former town of the same name, distant about 4 miles, is now in ruins. It is described by St Martin as a very ancient Armenian city, and the large plain in which it was situated is still inhabited by Armenians, Catholics, Nestorians, &c. Pop. of D. estimated at 15,000.

**DI'LUENTS** (Lat. *diluo*, I dilute), medicines whose purpose is to dilute the blood, and increase the quantity of the excretions generally. The simplest and best of diluents is water; but all watery fluids, such as lemonade, soda-water, beer, infusions or ptisans, tea, &c., may be regarded as coming under this designation. See DEMULCENTS.

**DILU'VIUM**, a term formerly given by geologists to those strata which they believed to have been formed by the Deluge, and more particularly to the boulder clay. The altered opinions as to the origin of these beds have caused the word to fall into disuse. When the adjective—diluvial—is employed by modern writers, it is to characterise those accumulations of gravel or angular stones which have been produced by sudden or extraordinary currents of water.

**DIME**, the tenth part of a United States dollar (see DOLLAR), and equal to about fivepence English.

**DIME'NSION.** In Geometry, a line, whether straight or curved, has only one dimension, or measurement—namely, length; a surface has two—length and breadth; and a solid has three dimensions—length, breadth, and thickness, or depth. These three measurements or dimensions determine all forms of extension.—In Algebra, the term dimension is applied in much the same sense as *degree*, to express the number of literal factors that enter into a term. Thus, $x^2$, $xy$, $2ab$, are all of two dimensions, or of the second degree; $x^3$, $x^2y$, $abc$, $\frac{a^2bc}{d}$, are of three dimensions, &c.

**DIMINUE'NDO** (Ital. diminishing), a term in Music, having reference only to the power of the sound, and in no way affecting the *tempo*, as many think. Diminuendo can be applied to a single note, when it is a long note, as well as to a passage of many notes. Diminuendo is so nearly of the same meaning as decrescendo, that it is frequently marked with the same sign, thus $>$

**DIMINU'TIONS**, a word sometimes used in Heraldry for differences, marks of cadency, and brisures, indifferently.

**DIMI'NUTIVES** are forms of words, chiefly of substantives, in which the primitive notion has become lessened or diminished, as *hillock=a little hill.* With littleness is associated the idea of neatness, and also of needing protection; hence diminutives are used as terms of endearment; sometimes they imply contempt. There is perhaps no language without diminutives; and the most common method of formation is by the addition of a syllable. This, however, is not the only method; *tip* from *top*, by attenuating the vowel, and *kid* from *goat*, are as genuine diminutives as *hillock*. The commonest of the English diminutive affixes are *ock*, *kin*, *el* or *le*, which are of Gothic origin, and *et* or *let*, of classical origin; as in *bullock*, *lambkin*, *kernel* (little corn), *lancet*. According to Dr Latham, the termination *ling*, or rather *ing*, was originally patronymic; 'Ida was the son of Eoppa,' was expressed in Anglo-Saxon by *Ida wæs Eopping*. From the notion of the filial relation, the transition is easy to that of littleness and endearment, as in *darling*, *duckling*. Contempt predominates in *shaveling* (a monk) and others.

Diminutives often occur in proper names; *Perkin* is the diminutive of *Peter*, *Jenkin* of *John*. These have settled down into permanent and distinct names; but in the language of fondness and familiarity, *Charles* becomes *Charley*, *John*, *Johnny*, &c. In Lowland Scotch, this form of diminutive is not confined to proper names, but is applied to every object, animate or inanimate—*laddie*, *horsie*, *wifie*, *firie*. Sometimes one diminutive affix is joined to another, as *lassock*, *lassockie*; and in expressions like *a wee*, *wee bit horsikie*, the diminution is carried to the fifth degree. It is principally in the mouths of the people and in friendly familiarity that these diminutive forms are most common; and some languages and dialects are rich in them beyond others. Italian is remarkable in this respect, especially the Tuscan dialect: *casa*, house, becomes *casarella*, little house, and *casarellina*, pretty little house; from *fratello*, brother, which is itself a diminutive of the Lat. *frater*, children, it is said, may be heard forming such fond names as *fratellinucciettinetto*. The affectionateness and bonhomie of the Germans expresses itself largely in this form; *vater*, father, becomes *väterchen*, dear father; and even the pronoun *du*, thou, is made into *duchen*, and *duli*.

Diminutives are not confined to nouns: *whitish* is the diminutive of the adjective *white*; and *tipple*, *scribble*, *dandle* are examples of diminutive verbs. Opposed to diminutives are AUGMENTATIVES, which abound in the Romanic languages, especially in Italian, and express not only largeness, but coarseness and vulgarity; *casotta* is a large house; *cavallaccio*, a worthless horse. Our word *balloon*, which is of foreign origin, is of this form, and means a large ball. Such words as *drunkard*, *braggart*, *buzzard*, seem to be genuine English augmentatives.

**DI'MITY**, a stout figured cotton-fabric, used chiefly for bed-hangings. The figure or stripe is raised on one side, and depressed on the other, so that the two faces present reversed patterns. Dimity is commonly white, or of a single colour; but variegated dimities are now made, the pattern and the ground being of different colours.

**DIMO'RPHOUS** (Gr. *dis*, twice; *morphe*, shape or form) is the term applied to a substance when it exhibits the property of crystallising in two distinct forms or systems. See CRYSTALLOGRAPHY. Thus, sulphur, as found crystallised naturally, and as obtained by the spontaneous evaporation of its solution in bisulphuret of carbon, or in chloride of sulphur, presents itself in crystals of the form of octohedra, with a rhombic base, and thus belongs to the *prismatic system*; but when sulphur is heated to fusion, and then slowly cooled, prismatic crystals of an amber colour are obtained, which belong to the *oblique system*. The latter form of sulphur is not permanent, and the crystals gradually become opaque, and pass into the form of numberless octohedra. In their turn, the octohedral crystals, when kept at a temperature of 230° F. for some time, pass into the prismatic form. Carbon is another illustration of *dimorphism*. Thus carbon crystallises in the diamond in the regular system as the octohedron and allied forms; while in the condition of graphite or Black Lead (q. v.), as obtained by the cooling of its solution in fused cast iron, it is in the form of hexagonal crystals belonging to the rhombohedral system. Carbonate of lime and iodide of mercury are also good examples of dimorphism; and some substances, such as the sulphate of nickel, sulphate of zinc, seleniate of nickel, and the seleniate of zinc, crystallise in three different systems, and are thus *trimorphous*.

**DINAGEPO'RE**, a city of the sub-presidency of Bengal, with about 30,000 inhabitants, stands 261 miles to the north of Calcutta, in lat. 25° 34′ N., and long. 88° 38′ E. It is watered by an offset of the Attree, called the Purnabada, which, through the Mahanunda, enters the Lower Ganges from the left. The place is devoid of architectural pretensions.

**DINAGEPORE**, the district of the above-mentioned city, stretches in N. lat. from 24° 53′ to 26° 38′, and in E. long. from 88° 2′ to 89° 16′, containing 3820 square miles, and 1,200,000 inhabitants. The country is flat, its only eminences being mere undulations; and, from the proximity of the Himalayas, the whole tract is little but a net-work of water-courses, many of the channels, however, becoming periodically dry. The winds are more variable than is usual elsewhere in India, and hail-stones are occasionally of such weight as to kill men and cattle. Rice is the principal crop, and fish are singularly plentiful.

**DINAN**, a very old town of France, in the department of Côtes-du-Nord, on the Rance, 30 miles north-west of Rennes, and 14 south of St Malo. The situation of D., on the summit of a steep hill of granite, and with the Rance flowing through a valley 250 feet below, is romantic in a high degree. It is surrounded by high walls, pierced by four gates, and was formerly defended by a strong castle, part of which has been converted into a prison. In the older district, the streets are crooked, narrow, and steep, many of the buildings being crazy constructions of wood; but in some parts, its overhanging houses, and arcades resting on carved granite pillars, present many picturesque architectural features, attractive to the antiquary and the artist. The cathedral of St Sauveur is a beautiful ornate edifice, built in the Romanesque style, containing the heart of the famous French warrior Bertrand du Guesclin. D. has manufactures of fine linen and of sail-cloth, of cotton and woollen goods, beet-root-sugar, &c. It has also some barge-building yards, and, owing to its position near the mouth of the Rance, has a considerable coasting and inland trade. Pop. 7420. A few miles off lies the village of Corseult, built on the ruins of the capital of the ancient Curiosolitæ. In the fields round about the village are still occasionally found ancient utensils, Roman coins, and traces of a temple dedicated to Mars.

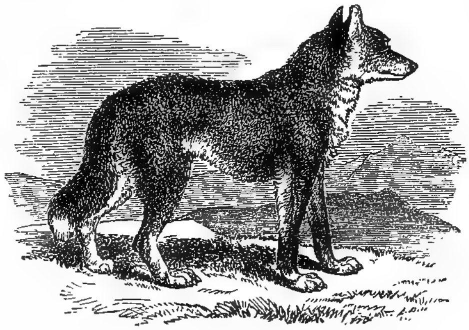
**DINA'NT**, a town of Belgium, in the province of Namur, 14 miles south of the city of that name. It is situated on the Meuse, in the midst of extremely picturesque scenery. The most noteworthy buildings of D. are the church of Notre Dame, an ancient and richly decorated Gothic structure, and the town-house, once the palace of the princes of Liége. D. has several salt-refineries, mills for sawing marble, some quarries of which are worked in the vicinity, paper-mills, breweries, and tanneries. It has also manufactures of woollen stuffs, paper, hats, cards, and cutlery. The gingerbread of D., composed of rye-flour and honey, is famous, and has an extensive sale. Pop. 6388. D., which dates from the 6th c., has suffered greatly from frequent sieges. In 1466, Philip Duke of Burgundy attacked it with a strong force, and, when the town was taken, in retaliation for the hanging of the messengers whom he had sent to summon the town to surrender, he ordered 800 of the inhabitants to be tied in couples, back to back, and cast into the Meuse. At this time, also, the town was burned, and the walls levelled.

**DINAPO'RE**, an important military station in the sub-presidency of Bengal, stands on the right bank of the Ganges, about ten miles above Patna, in lat. 25° 37′ N., and long. 85° 7′ E. The barracks are spacious and elegant; and the population—exclusive of the garrison, to which it is chiefly an appendage—numbers about 20,000. In the mutiny of 1857, D. acquired an unenviable notoriety. On 25th July, nearly eleven weeks after the commencement of the outbreak, the native troops, consisting of three regiments, rose against their officers, and that in the presence of a European force, which, if well handled, was as able, as it was ready, to crush them. After escaping with comparatively little loss, the insurgents clinging instinctively together, carried on a desultory warfare on their own account with various success. See Arrah.

**DINA'RIC ALPS**, that branch of the Alpine system which connects the Julian Alps with the western ranges of the Balkan. It extends in a south-easterly direction, from Mount Klek, east of Fiume, to the mouth of the Narenta; and stretching along the borders of the Adriatic, it spreads its ramifications through the greater part of Croatia, Dalmatia, and Herzegovina. The D. A., the highest summits of which are Mount Dinara and Mount Prolok, seldom exceed 7000 feet in height. The range is principally calcareous.

**DI'NGLE**, a seaport, the most westerly town in Ireland, is situated in county Kerry, in a hollow on the north side of Dingle Bay, near the west end of a mountainous peninsula (30 miles by 7), 39 miles west-north-west of Killarney. It chiefly consists of one street, and has an antique aspect, some of the present houses having been built in the 16th c., in the Spanish style, with stone balconies, &c. Pop. about 3251. The chief exports are corn and butter to Liverpool. D. was incorporated in 1585. In the 17th c., D. had much trade with Spain, exchanging tanned hides, Irish friezes, woollen stockings, salt beef, salmon, and butter, for wines and spices. Dingle Bay is an indentation of the sea, on the west of Kerry, between Brae Head, Valentia Isle, on the south, and Dunmore Head and Blasket Isles on the north, from which points, which are 18 miles apart, it runs 24 miles east-north-east, narrowing to 7 miles. D. harbour is a landlocked creek in the bay, admitting ships of 300 tons up to the town of D., and forming a pretty safe retreat from the prevalent west winds of Dingle Bay.

**DI'NGO** (*Canis Dingo*), the native dog of Australia, regarded by some naturalists as a distinct species, by others as a mere variety of *Canis familiaris*. It exists both in a wild and in a domesticated state; but there is no good reason for thinking that the wild race has originated from dogs introduced from some other country by man. The domesticated D. is about the size of a shepherd's dog, the wild one is larger. The wild D. is found in all parts of Australia. It is of a tawny colour, has a large head, with muzzle somewhat fuller than the shepherd's dog. The ears are short and erect, the tail bushy, but not so bushy as that of a fox. In running, the D., unlike dogs in general, carries the head high, the ears erect, and turned forward. In a wild state, it does not bark. It is very destructive to the sheep of the colonists, and its delight is to kill as many as possible before proceeding to eat. It is very fierce and courageous, but capable of strong attachments.



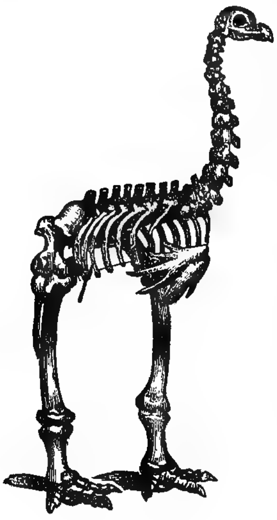
Dingo, or Australian Dog (*Canis familiaris*).

**DI'NGWALL**, a royal and parliamentary burgh, the county town of the united counties of Ross and Cromarty, in the south-east of Ross-shire, at the head or south-west end of the Cromarty Firth, 11 miles north-west of Inverness. In Scandinavian, D. means Law or Court Hill; and in Gaelic, it is called Inverpheoran. It consists chiefly of a long street, and lies low, on what was formerly a swamp, amid rich, fertile, and well-wooded ground, at the entrance to the beautiful valley of Strathpeffer, the famous sulphureous springs of which are five miles to the west. A short canal brings vessels drawing nine feet of water up to the town, where there is also a station of the Inverness and Ross-shire Railway, expected to be opened in 1862. Its prosperity depends on agriculture. Pop. (1861) 2084, many speaking Gaelic, though all understand, and usually speak, English. It unites with Tain, Dornoch, Wick, Kirkwall, and Cromarty in sending one member to parliament. Near to D. is a vitrified fort, on a conical hill, and there are traces of an ancient castle, where the earls of Ross held their courts.

**DI'NKELSBÜHL**, a town of Bavaria, situated on the Wernitz, 44 miles south-west of Nuremberg. It is an ancient walled town, and was formerly a free city of the empire. It has important manufactures of hosiery, coarse linen, straw-hats, paper, &c.; and a dye-work, brewery, and several mills. D. suffered much during the Thirty Years' War. Pop. 7000.

**DI'NNER.** See Meals.

**DINO'RNIS** (Gr. *deinos*, terrible or wonderful, and *ornis*, a bird), a genus of large birds of the tribe *Brevipennes* (q. v.), of which no species is now known to exist, but of which the bones have been found in New Zealand, in the most recent deposits, in the sand of the sea-shore, in swamps, in the soil of forests, in river-beds, and in caves; and concerning which, along with other large birds nearly allied to them (*Palapteryx* and *Aptornis*), traditions are still current among the natives, rendering it probable that they continued to inhabit New Zealand, if not to the 18th, at least to the 17th century. The name by which these birds are known in the traditions of New Zealand is *Moa*. They are said to have been decked in gaudy plumage, for the sake of which they were objects of pursuit, as well as for their flesh, which was much esteemed. They are also described as having been stupid, fat, and indolent birds, incapable of flying, living in forests and mountain-fastnesses, and feeding on vegetable food. With all this, the inferences deduced from their bones by comparative anatomists perfectly agree. These bones are not properly fossil or mineralised, but retain great part of their animal matter. It is even thought not impossible that some of the smaller species of D. may yet be found alive; of the larger ones, this can no longer be hoped. And these much exceeded in size any existing bird, some of the bones being at least twice the size of those of the ostrich; but the body seems to have been more bulky in proportion, and to have more resembled that of the dodo, although the legs were long, and *D. giganteus* must have stood at least ten feet and a half in height. The framework of the leg is the most massive of any in the class of birds, and the bones are remarkable for the solidity of their structure. The toe-bones of *D. elephantopes* almost rival those of the elephant.

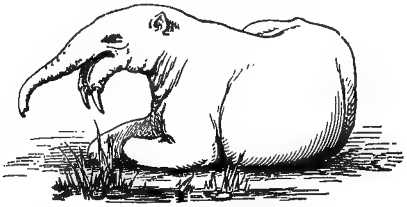


Dinornis Elephantopes.

The number of bones of D. which have been found is great; several species have been distinguished, and an almost complete restoration of skeleton has been effected. The first bone ever seen by a naturalist—a bone of the leg—was brought under the notice of Professor Owen in 1839; and it is worthy of being borne in mind, that from that one bone he assigned to the D. its true place in the system of nature, and pointed out some of the most important characters which are now most fully proved to have belonged to it.

**DINOSAU'RIA** (Gr. terrible or wonderful lizards), an order of extinct lizards, which are found in the lias, oolite, and wealden, and disappear in the lower cretaceous beds. They were gigantic reptiles, with a structure approaching nearer to the mammalian type than any other of their class. Their bodies were supported, at a considerable height, on four strong limbs, and the sacrum was composed of five amalgamated vertebræ. The principal genera are Megalosaurus (q. v.), Iguanodon (q. v.), and Hylæosaurus (q. v.).

**DINOTHE'RIUM** (Gr. terrible or wonderful beast), a remarkable extinct animal, the cranial bones of which are found in the Miocene formations of Germany, France, &c. The animal was provided, like the elephant and the walrus, with a pair of long tusks; but these projected from the end of the lower jaw, which is deflected downwards at a right angle to the body of the jaw. In addition to the two tusks, there were five double-ridged grinders on each side of both jaws. The nasal cavity is large, apparently supplying attachment for a trunk, as in the elephant. No body or limb bones have yet been found so associated with those of the skull, as to shew that they belonged to the same animal. Hence the true position of the D. has not been satisfactorily determined. Cuvier and Kaup have referred it to the neighbourhood of the tapir, supposing it to have been an inhabitant of large lakes. We give a figure of Kaup's restoration. De Blainville, on the other hand, makes it a herbivorous cetacean, like the manatee.



Restored Form of Dinotherium.

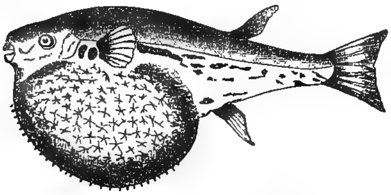
**DIO'CESAN** is a bishop viewed in relation to his own clergy or flock.

**DIOCESAN COURTS.** See Consistorial Courts.

**DI'OCESE** (Fr., from Gr. *dioikesis*, administration; and *dioikeo*, to govern), the territory over which a bishop exercises ecclesiastical jurisdiction. The term occurs as early as the time of Cicero, as the special designation of districts in Asia Minor. In the organisation of the Roman Empire introduced by Constantine the Great, the designation diocese was applied to the larger divisions, which were subdivided into provinces. About the middle of the 5th c., the dioceses of the empire were: the East, Egypt, Asia, Pontus, Thrace, Macedonia, Dacia, Illyria, Italy, Africa, Gaul, Spain, and Britain. The dioceses were governed some by Prefects, some by Proconsuls, and others by Vicars. The provinces were under Rectors. The government of the Christian religion, as established by Constantine, was in so far adapted to this division, and the term diocese and others passed over to ecclesiastical matters. At first, a diocese meant the collection of churches or congregations under the charge of an archbishop. The name came afterwards to be applied to the charge of a bishop, which had previously been called a parish. England and Wales are divided ecclesiastically into two provinces, viz., Canterbury and York, the former being presided over by the Primate of All England, and the latter by the Primate of England. Each of which is subdivided into dioceses, and these again into archdeaconries, rural deaneries, and parishes. A diocese is synonymous with the see of a suffragan bishop.

**DIODA'TI**, Jean, a Swiss theologian, was born in Geneva in 1576. He belonged to a noble Italian family, originally of Lucca. His progress in letters was so rapid, that Beza caused him to be appointed professor of Hebrew at the age of 21. In 1608, he became a pastor of the Reformed Church, and in the following year, professor of theology. About this period, he endeavoured to spread the doctrines of the reformation in Venice and other cities of Italy, but without success. In 1614, he went to Nîmes, where he preached for three years; and in 1618, he was sent to the synod of Dort, to represent the Genevese Church. Here his talents were so highly estimated that he was one of the divines appointed to draw up the articles of the synod. He died at Geneva in 1649. D. was a somewhat intolerant Calvinist; but as a preacher, he was eloquent, persuasive, and conscientious. His Italian translation of the Bible appeared in 1607; his French, in 1644. Among his other works may be mentioned his *Annotationes in Biblia* (1607), *De Fictitio Pontificiorum Purgatorio* (1619), and *De Justa Secessione Reformatorum ab Ecclesia Romana* (1628).

**DI'ODON** (Gr. two-toothed), a Linnæan genus of fishes, now giving its name to a family, *Diodontidæ* (*Gymnodontes* of Cuvier), of the order *Plectognathi.* The fishes of this family have no distinct teeth, but their jaws, which are shaped like the beak of a parrot, are covered with a substance like ivory, formed of the teeth consolidated together. This is reproduced as fast as it is worn away by use, and the mouth is admirably adapted for grinding down the crustaceans and sea-weeds on which these fishes feed. Their flesh is mucous, and that of some is regarded as poisonous. None of them are used for human food. Some of them, particularly of the genera D. and *Tetraodon*, have a remarkable power of inflating their bodies by filling their stomachs with air, the stomach being extremely dilatable, and assuming a globular form when distended, whence they have received the name Globe-fish, whilst from the spines, which stand out in all directions, like those of a hedgehog when rolled up, as if for defence of the inflated body, some of them have been designated Porcupine Fish. When distended with air, they float in the water with the back downwards, but are not incapable of swimming in this position, as was formerly supposed. The *Diodontidæ* are fishes of warm seas; one or two species, occasionally wafted by the currents to more northern shores, are among the rarest of British fishes.—The Sunfish belongs to this family. The name D. has recently—with the effect only of confusion—been given to a new genus of cetaceous animals, of which one very rare species has occurred on the British coast.



Globe-fish (*Tetraodon lævigatus*).

**DIODO'RUS**, Siculus, a Greek historian, was born at Agyrium, in Sicily. Little is known of his life beyond what is told by himself. He lived in the times of Julius and Augustus Cæsar, travelled in Asia and Europe, and lived a long time in Rome, collecting the materials of his great work, the compilation of which occupied thirty years. This work, the *Bibliotheca* or Library, was a history of the world, in forty books, from the creation to the Gallic wars of Julius Cæsar. It was divided by the author into three parts—the first of which, in six books, comprises all the Greek and foreign myths down to the Trojan war; the second, in eleven books, contains the history from the year 1184 B.C. to the death of Alexander the Great; the third, in 23 books, continues the narrative of events from that date to the year 60 B.C. Of the *Bibliotheca*, the first five books are extant entire; the next five books are wholly lost; the next ten are complete; and of the remainder of the work, considerable fragments have been preserved. Had D. possessed any powers either of criticism or of arrangement, his work would have been of the greatest importance; but he was in both respects so deficient, that his history has no practical value beyond what belongs to an immense mass of raw, and now scarcely available material. His narrative is colourless and monotonous, and his diction, generally clear and simple, holds a sort of middle place between the pure Attic and the colloquial Greek of his time. The best editions of D. are Wesseling's (Amst. 1746), the Deux-ponts (1793—1801), and Dindorf's (Leip. 1828—1831).

**DIŒ'CIOUS** (Gr. *dis*, twice; and *oikion*, a habitation), in Botany, a term applied either to plants or flowers, when not only the flowers but the individual plants are unisexual—i. e., when male and female flowers are produced upon separate plants. D. plants form a distinct class in the Linnæan sexual system; but in thus placing them apart, if the principle of arrangement had been strictly maintained, great violence would often have been done to natural affinities; D. species frequently occurring in genera and families usually *Monœcious* (q. v.) or *hermaphrodite*, and also monœcious and hermaphrodite species in those which are usually diœcious. Familiar examples of D. plants may be seen in most species of willow. Amongst cultivated plants, hemp, spinach, and the date-palm may be named as instances.

**DIO'GENÉS LÄE'RTIUS**, the author of a biographical history of the Greek philosophers, seems to have been born at Laerta, in Cilicia, and to have taken his surname from that town. So little is known of his personal history, that the very age in which he flourished is a matter of doubt. By some it is assigned to the end of the 2d, and by others to the middle of the 3d c. after Christ. His name has been kept alive by his *Lives of the Philosophers*, a work which contains a great mass of interesting information regarding the private lives and habits of the most eminent philosophers of antiquity. Though the work is utterly worthless in respect of plan, coherence, or criticism, it yet contains so many piquant anecdotes, and so many valuable quotations from lost works, that Montaigne's wish was perhaps a justifiable one—that instead of one Laertius, we had had a dozen. The best edition of Laertius is that of Hübner, 2 vols. 8vo (Leip. 1828—1831).

**DI'OMEDE ISLANDS**, a group about the middle of Behring's Strait, form, as it were, a number of stepping-stones between the most easterly point of Asia and the most westerly of America. Their names are Fairway, Crusenstern, and Ratamanow; and their central point is in lat. 65° 46′ N., and long. 168° 55′ W.

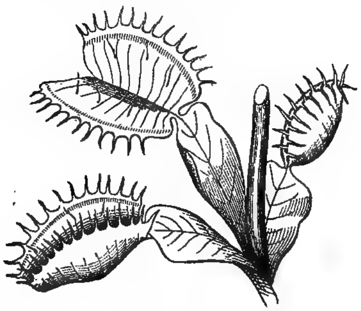
**DIOME'DEA.** See Albatross.

**DIOME'DES**, the bravest, after Achilles, of all the Greeks who took part in the Trojan war. His exploits occupy a prominent place in the record of the heroic deeds sung by Homer in the *Iliad.* He vanquished in fight Hector and Æneas, the most valiant of the Trojans; and even Mars and Venus, when they took the field on the Trojan side, were attacked and wounded by him. In the games instituted by Achilles in honour of Patroclus, he gained the prize in the chariot-race, and worsted the mighty Ajax in single combat. Along with Ulysses, he carried off the Palladium, on which the fate of Troy depended. On returning to Argos (to the crown of which he had succeeded after the death of Adrastus), he found that his wife had proved unfaithful in his absence. Leaving home, he went, according to one tradition, to Italy, where he took part with the Trojans against Turnus. Several cities on the southern shores of that country claimed to have been founded by him.

**DI'ON CA'SSIUS COCCEIA'NUS**, a celebrated Greek historian, was born at Nicæa, in Bithynia, 155 A.D. He held various high offices of state under the Roman emperors, was twice consul, and enjoyed the intimate friendship of Septimius Severus. He is best known by his *History of Rome*, in 80 books, of which only 18 (from the 36th to the 54th) have reached us complete. The others are only known to us from fragments and abridgments. His high position gave him free access to the national archives, and as an authority on some points, especially on the imperial epoch of Roman history, his work is not without very considerable value. He wrote on the model of Thucydides, to whom, indeed, he is far inferior, both in vigour of judgment and acuteness of criticism; yet many passages of his History might be quoted as among the best samples of the rhetoric of the age in which he lived. D. died at Nicæa, but the date of his death is not known. The best edition of his History is that of Sturz (Leip. 1824—1843).

**DI'ON CHRYSO'STOMUS** (Golden-mouthed), an eminent Greek rhetorician, was born at Prusa, in Bithynia, towards the middle of the 1st century. His father, Pasicrates, paid great attention to his education, which was also enriched by travel. D., after residing for some time in his native town, came to Rome, where, however, he had the misfortune to excite the suspicion of the Emperor Domitian, and was in consequence obliged to flee. On the accession of Nerva, 96 A.D., he returned to Rome, and was honourably received. Nerva's successor, Trajan, held D. in the highest estimation, even permitting him to ride beside himself in the imperial chariot. His excellent disposition procured him many friends, while his remarkable powers of oratory excited universal admiration. He died at Rome about 117 A.D. D. left a very great number of orations, of which 80 are still extant in whole, with fragments of 15 others. They discuss questions in politics, morals, and philosophy, and are written in pure Attic Greek. According to Niebuhr, he was 'the first writer after Tiberius that greatly contributed towards the revival of Greek literature.' A good edition of D.'s orations is that of Reiske (Leip. 1784).

**DIONÆ'A**, a very curious and interesting genus of plants of the natural order *Droseraceæ*, having a 5-partite calyx, 5 petals, 10—20 stamens, and one style, with 5 closely united stigmata. Only one species is known, *D. muscipula*, sometimes called VENUS'S FLY-TRAP and the CAROLINA CATCHFLY PLANT. It grows in marshy places in the warmer parts of North America, as far north as North Carolina, and is a perennial plant, with a rosette of root-leaves, from the midst of which arises a leafless stem (scape) about 6 inches high, terminating in a corymb of white flowers. It is remarkable for the irritability of its leaves. The leaf-stalk is elongated, winged, and leaf-like, and bears at its extremity an orbicular leaf, set round at the margin with long stiff bristly hairs, and having on its upper surface many small glands, and three delicate irritable hairs on each side, so placed that an insect can hardly traverse the leaf without touching one of them, when the two sides of the leaf immediately fold together upon it, and lay hold of it, the marginal bristles crossing one another, and preventing the possibility of escape. The leaf does not open again till the insect is dead, and there is no longer any irritation caused by its motion. The juice from the glands seems to attract insects; but the use of all this to the plant is unknown, for that it sucks the juice out of its insect prey, or receives nourishment from the bodies of insects dissolved in a mucilaginous exudation from its glands, has only been conjectured, and not proved. Nor has the upper surface of the leaf any prickles which might pierce or lacerate insects.—The *Dionæa* is sometimes to be seen in hothouses.



Dionæa.

**DIONY'SIUS, THE AREOPAGITE**, is mentioned in the Acts of the Apostles (chap. xvii., verse 34) as one of the few persons in Athens converted to Christianity by Paul. A history has been invented for him by the church. It is said that he was in Egypt when the Crucifixion happened, and observing the eclipse that accompanied it, exclaimed: 'Either God himself is suffering, or he sympathises with some one who is suffering.' At the time when Paul visited the metropolis of Greece, D. was a member of the council of the Areopagus, whence his name. Tradition also declares that the apostle installed him as the first Bishop of Athens, and that he suffered the fate of a martyr. The writings which are falsely current under his name treat of such topics as the heavenly hierarchy, the names of God, the ecclesiastical hierarchy, &c. Their theology is of the mystical kind. The style, contents, and historic allusions clearly indicate that the author of these writings could not have flourished before the close of the 5th c., and, in fact, the writings first made their appearance in the 6th century. Dazzling neoplatonic phantasies concerning the divine essence, angels, and holy spirits, splendid descriptions of the ceremonies of the Catholic worship, glorifications of the priestly hierarchy, panegyrics on monastic life, and mystical interpretations of church doctrine, made the works immensely attractive, especially to the Greek monks, whose manner of life was pre-eminently contemplative. According to a recent hypothesis, the so-called writings of D. are the composition of some Christian Platonist, who, in opposition to the not yet wholly extinguished Gnosticism, sought to incorporate with Christianity the forms, ideas, and ceremonies of the Dionysian (Bacchic) mysteries. The translation of the work into Latin by Scotus Erigena, in the dawn of the middle ages, gave a new impulse to monasticism in the Western Church, and may be almost said to have created its mystic theology. The *Areopagitic Theology* was, in fact, the name given during the middle ages, and even as late as the 18th c., to that mystical method of apprehending religious truth made current by the writings ascribed to D., and afterwards formally introduced into Latin Christianity by Hugo St Victor in the 12th century. This theology proceeds upon the principle, that the Divine Spirit is indispensable even to the understanding of man.

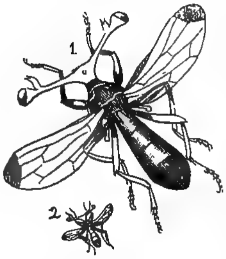
**DIONYSIUS, THE ELDER**, tyrant of Syracuse, was born 431 or 430 B.C. He was originally a clerk in a public office, but manifested at an early period a passion for political and military distinction. When the Agrigentines, after the conquest of their city by the Carthaginians, accused the Syracusan generals who had failed to relieve them of treachery, D. supported their accusations before the people of Syracuse, and induced the latter to appoint new commanders, of whom he himself was one. But in a very short time he supplanted his colleagues also, and, when only 25 years of age, made himself, by the help of his mercenaries, absolute ruler of the city. To strengthen his 'tyranny' (the name given by the Greeks to any *usurped* authority, however wisely and beneficently exercised), he married the daughter of Hermocrates, the late head of the aristocratic party, and thus attached the followers of that leader to himself. After he had fiercely suppressed several insurrections, and conquered some of the Greek towns of Sicily, he made preparations for a great war with the Carthaginians. It broke out 397 B.C. At first, fortune favoured D., but after a short time he suffered a series of reverses, so calamitous, that all his allies abandoned him, and he was shut up in the city of Syracuse, apparently without hope of escape. When he was about to fall a victim to despair, a pestilence broke out in the Carthaginian fleet. D. took courage, and suddenly attacking his enemies by land and sea, obtained a complete victory. In the years 393 and 392 B.C., the Carthaginians renewed hostilities, but were defeated on both occasions, and D. was enabled to conclude a most advantageous peace. He now turned his arms against Lower Italy, and in 387 B.C., after a siege of 11 months, captured Rhegium. From this time he continued to exercise the greatest influence over the Greek cities of Lower Italy, while his fleets swept the Tyrrhenian and Adriatic Seas. But D. was not contented with the reputation of being the first warrior and statesman of his age; he wished to shine as a poet also. He even ventured so far as to contend for the prize at the Olympic games, and about the end of 388 B.C., sent thither a splendid embassy, comprising the best reciters of the time, whose utmost skill, however, could not induce the judges to decide in his favour. D. was more successful at Athens, where he several times obtained the second and third prizes for tragedy, his last production even obtaining the first. He also invited many poets and philosophers to his court, his treatment of whom, however, was not always courteous. In 368 B.C., he renewed the war with the Carthaginians, whom he wished to drive out of Sicily altogether, but died in the following year, before he could accomplish his design. It was rumoured that his death was hastened by his physician, at the instigation of his son. D. was unquestionably a most vigorous ruler, but unscrupulous as to the means he employed to secure his ends, and tormented in his last years by the suspicion that he was surrounded with traitors.

**DIONYSIUS**, THE YOUNGER, son of the preceding, celebrated his entrance into public life, 367 B.C., by a splendid festival, which lasted ninety days. His political education had been designedly neglected by his father, and in consequence he grew up an indolent, pleasure-loving, and dissolute prince. Dion, a relative of his father, sought to improve him by the instructions of Plato, but his endeavours were frustrated by Philistus, the historian, who disgracefully encouraged the excesses of the youth. Dion was banished, but afterwards returning to Sicily, expelled D. from Syracuse. The latter fled to Locri, the birthplace of his mother, Doris, where he was hospitably received. He repaid the kindness of the Locrians by making himself master of their city, which he ruled despotically for several years. In 346 B.C., the course of events enabled him to return to Syracuse, but he could not firmly re-establish himself. His cruelties drove the citizens to ask the aid of the Corinthians against him. Timoleon was sent to their assistance, and D., shut up in the citadel of Syracuse, was compelled to surrender, 343 B.C. He was brought to Corinth, where he soon squandered the wealth which he had carried away from Sicily, sunk into obscurity, and died in extreme poverty.

**DIONYSIUS**, OF HALICARNASSUS, a learned critic, historian, and rhetorician, was the son of one Alexander of Halicarnassus, and was born probably about the middle of the century before Christ. He came to Rome at the termination of the civil wars, 29 B.C., and resided there for 22 years, familiarising himself with the language, literature, and antiquities of the Romans. His death occurred shortly after 7 B.C. D.'s most valuable work is unquestionably his *History of Rome*, although it does not exhibit the finest qualities of his mind. The author was an admirable rhetorician, but had very little political discrimination, and no perception of the difference between a myth and a historic fact. Yet, inasmuch as it contains a mine of information about the constitution, religion, history, laws, and private life of the Romans, it will always command the regard of scholars. Of the 20 books of which it originally consisted, we possess only the first 9 in a complete form, the 10th and 11th nearly so; and of the rest, only a few fragments. The first edition of the Greek original was that by Stephens (Paris, 1546), but a very good Latin version was published as early as 1480. Angelo Mai published (Milan, 1816) a collection of the fragments of the lost books from a MS. in the library at Milan, the genuineness of which has been doubted by Niebuhr. The rhetorical and critical works of D. are of the highest literary merit. The principal are his *Censura Veterum Scriptorum*, his *Ars Rhetorica*, and his *De Compositione Verborum*. The first complete edition of the History (or Archæologia, as D. called it) and rhetorical works was that of Fr. Sylburg (Frankfort, 1586); one of the best is that of Reiske (6 vols., Leip. 1774—1777).

**DIOPHA'NTINE ANA'LYSIS** is that section of the theory of unlimited or indeterminate problems which attempts to find rational and commensurable values answering to certain equations between squares and cubes. This class of problems was first and chiefly treated of by Diophantus (q. v.), who has given his name to the theory of their solution. We shall not here attempt to explain the nature of the analysis, which is very subtle, and guided by few general rules. The difficulties of the solution of diophantine problems in most cases fall to be overcome by the skill and ingenuity of the analyst. We confine ourselves to stating the following examples of the problems solved by the Diophantine analysis: 1. To find two whole numbers the sum of whose squares is a square. 2. To find three square numbers in arithmetical progression. 3. To find a number from which two given squares being severally subtracted, each of the remainders may be a square.

**DIOPHA'NTUS**, a distinguished Greek mathematician, lived at Alexandria, according to some, about the middle of the 4th c.; according to others, about the close of the 5th. His name first occurs in the life of Johannes Damascenus, written by John, patriarch of Jerusalem, in the 8th century. He is commonly represented as the inventor of algebra, but he himself speaks of that science as known before his time. It is possible he may have been acquainted with Hindu algebra; at all events, according to De Morgan, there is a very great similarity between the Hindu algebra and that of Diophantus. He occupied himself chiefly with the class of problems characterised in the preceding article. Of his valuable work, the MS. of which was discovered in the 16th c., *Arithmetica*, consisting originally of 13 books, only six have been preserved. Besides this we possess a book on polygonal numbers. The best edition is that of Fermat (Toulouse, 1670); there is a German translation by Schulz (Berl. 1821).



Diopsis Ichneumonia:
1, magnified; 2, natural size.

**DIO'PSIS**, a genus of dipterous insects of the same great family with the house-fly, remarkable for the prodigious prolongation of the sides of the head, so as to form stalks for the eyes, which are thus removed to a distance from the body of the insect, almost equalling in some species the length of its wings. All the species are found in warm parts of the Old World.

**DIO'PTRICS** is that branch of geometrical optics (see OPTICS) which treats of the transmission of rays of light from one medium into another, differing in kind. It consists of the results of the application of geometry to ascertain in particular cases the action of what are called the laws of refraction. When a ray of homogeneous light is incident upon a surface, the angle which its direction makes with the normal or perpendicular to the surface at the point of incidence is in dioptrics, as in catoptrics, called the angle of incidence. The angle which the refracted ray makes with the same line is called the angle of refraction. This being premised, we may state the laws of refraction. 1. The incident and refracted ray lie in the same plane with the normal, at the point of incidence, and on opposite sides of it. 2. The sine of the angle of incidence, whatever that angle may be, bears to the sine of the angle of refraction a constant ratio dependent only on the nature of the media between which the refraction takes place, and on the nature of the light. According to the second law, if we call the angle of incidence $i$, and that of refraction $r$, we shall have $\sin i = \mu \sin r$, where $\mu$ is a quantity depending upon the nature of the media and of the light. It will have, for instance, a certain value for refraction from vacuum into glass, another from glass into water, and so on; also it will have one value for red light, another for green, and so on. The quantity $\mu$ is called the refractive index, and is greater than 1 when refraction takes place from vacuum into a medium, and in general is greater than 1 when the refraction is from a rarer into a denser medium, and less than 1 when the opposite is the case. In dioptrics, the laws of refraction may be considered as depending for their truth upon experiment; in physical optics, they are deductions from an hypothesis respecting the constitution of light. They are not merely approximately true; they are absolute physical laws.

Before proceeding to consider the simpler leading cases of refraction, one or two interesting propositions in dioptrics require to be explained.—1. If the refractive index for a medium, when light is incident upon it from vacuum, be $\mu$, and the index for another medium, under the same circumstances, be $\mu'$, then, when light proceeds from the second medium into the first, the refractive index is $\frac{\mu}{\mu'}$. The proof of this proposition depends upon the two following experimental laws: (1.) If a ray of light proceed from a point P, to another Q, suffering any reflections or refractions in its course, then, if it be incident in the reverse direction from Q, it will follow the exactly reverse course to P. This is proved by experiment, but may be accepted as axiomatic. (2.) If a ray pass from vacuum through any number of media, having their faces plane and parallel, when the ray emerges into vacuum its direction will be parallel to that which it had before incidence. To deduce the proposition from these laws, let $i$ be the angle of incidence from vacuum upon the medium B (fig. 1), $r$ the angle of refraction, which will also be the angle of incidence upon the medium A. Also let $r'$ be the angle of refraction into A, which will also be the angle of incidence upon the second bounding surface of A. By the second of the preceding experimental laws, the angle of emergence into vacuum will be $i$. Hence we shall have by the first of these laws, $\sin i = \mu' \sin r$ at the first surface, and $\sin i = \mu \sin r'$ at the second. From these equations, we have $\sin r = \frac{\mu}{\mu'} \sin r'$, which proves the proposition. It follows that if $\mu$ be the refractive index from vacuum into a medium, that from the medium into vacuum will be $\frac{1}{\mu}$.—2. Our second proposition relates to what is called the *critical angle.* If $i$ be the angle of incidence of a ray within a medium, the refractive index of which is $\mu$, and $r$ the angle of refraction into vacuum, then we have from the former proposition $\sin i = \frac{1}{\mu} \sin r$. From this formula, if $i$ be given, $r$ may be found, and a real value will be given to $r$ so long as $\sin i$ is $\angle \frac{1}{\mu}$; but when $i$ has a value greater than that determined by the equation $\sin i = \frac{1}{\mu}$, the formula fails to give us a value of $r$, for the sine of an angle cannot be greater than 1. And experiment shews that, in fact, there is no refracted ray when the angle of incidence is greater than that above assigned, the ray being wholly reflected within the medium. The angle of which the sine is $\frac{1}{\mu}$ is called the *critical angle.* For glass, it is about 41° 45′; for water, about 48° 30′. This angle is sometimes called the angle of *total reflection.* In internal reflection at the surfaces of media, the reflected light is more nearly equal in intensity to the incident than in any other case of reflection. While it thus appears that refraction from a denser into a rarer medium is not always possible, it may be added that it is always possible from a rarer into a denser.

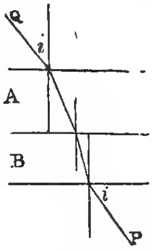


Fig. 1.

We shall now investigate some simple cases of refraction. 1. And first of refraction at a plane surface. Let DIMN (fig. 2) be any medium bounded by a plane DI, and let R be a radiant point, and RD and RI two incident rays of a divergent pencil proceeding from R to the surface of the medium; then RD being perpendicular to the surface, suffers no refraction, but proceeds along DM within the medium; but RI is refracted in the direction IN, which, produced outwards, meets the normal DF in F. Therefore, a small pencil of rays proceeding from R, and having RD, perpendicular to the surface, for axis, will be refracted into another pencil diverging from the imaginary focus F; for all the rays intermediate between RD and RI will converge very near F when the pencil is small. An eye within the medium, and between N and M, would thus, the pencil being small, see the luminous point R, as if it were at F, or further off than it really is. In the opposite case, represented in fig. 3, R being within the refracting medium, similar reasoning shews that after the rays emerge from the plane surface into the air, they will, if the pencil be small, appear to proceed from an imaginary focus F, nearer to the surface than R, the luminous point.

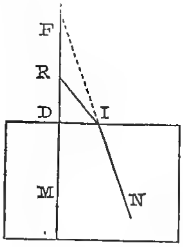


Fig. 2.

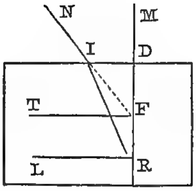


Fig. 3.

2. The case of refraction through a prism, which we are next to consider, is, in fact, the case of refraction through a medium bounded by plane surfaces which are not parallel. Conceive two planes at right angles to the plane of the paper, and making on that plane the figure BAC (fig. 4). The question is as to the laws of transmission of a ray, SPQR, of homogeneous light through the prism. Draw $mn'$ and $n'n$ perpendicular to the sides. Then $n'$PQ and $n'$QP are respectively the angles of refraction at the first, and of incidence at the second surface. Now, as $n'$QA and $n'$PA are each of them right angles, and as all the angles in the figure $n'$QAP are equal to four right angles, it follows that the angles at $n'$ and at A together are equal to two right angles. But the angle at $n'$, together with the angles $n'$PQ and $n'$QP, are equal to two right angles; therefore must the angles $n'$PQ and $n'$QP together be equal to the angle at A. In other words, in refraction through a prism: *The sum of the angles of refraction at the first surface, and of incidence at the second, is equal to the angle contained between the plane sides of the prism.* From this it might be shewn, that the deviation of a ray caused by passing through a prism is always towards the thicker part of the prism, if the medium be denser than the surrounding atmosphere. It is a geometrical proposition which the student may solve for himself, that if $i$ be the angle of incidence at the first surface, and $e$ that of emergence at the second, and if $\alpha$ be the angle of the prism, then $\delta$, or the change of direction of the ray in its passage, is obtained from the formula $\delta = i + e - \alpha$.

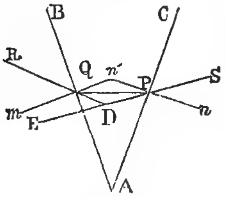


Fig. 4.

3. We now take up the case of refraction at a single spherical surface of a medium denser than the surrounding air. And first, of parallel rays refracted at a convex spherical surface. Let ABQP (fig. 5) be the refracting medium, whose terminating convex surface is spherical, C being the centre of the surface, and V its vertex. Let XV be the axis of a pencil of parallel rays, of which any ray, RI, is incident at I. Then, if CIN be a normal, the angle of refraction, CIF, will be less than the angle of incidence, RIN, and the refracted ray will thus turn towards the axis, and meet it at some point, F. When the pencil is small, or the aperture, AVB, of only a few degrees, the rays will clearly nearly all converge to the same point, F. To find the position of F, we have, in the triangle ICF, the angle CIF = $r$, the angle of refraction, and ICF, the supplement of ICV or NIR (by parallel lines), i. e., of $i$, or the angle of incidence. Therefore, IF is to CF : : sin $i$ is to sin $r$. And as for a very small pencil, IF may be taken = VF, we have FV : FC : : sin $i$ : sin $r$, or : : $\mu$ : 1. And putting FV = F, the principal focal distance, and VC = R, we have $F = \frac{\mu}{\mu - 1} R$. If the medium be crown-glass, for which the value of $\mu$ is $\frac{3}{2}$, we have $F = \frac{\frac{3}{2}}{\frac{3}{2} - 1} R$, or $F = 3R$; i. e., the principal focal distance is equal to three times the radius of the sphere. The student may, by similar reasoning, ascertain for himself the focus of parallel rays incident on a concave spherical refracting surface, as also the focus in the case of a pencil of parallel rays within the medium and emerging from it. The case of a divergent pencil is incapable of such elementary treatment as to justify its insertion here. For branches of the subject, treated under separate heads, the reader should refer to the articles CAUSTIC, LENS, and REFRACTION. Under REFRACTION, he will find a table of the values of $\mu$—the refractive index for various media and kinds of light. See also the articles SPECTRUM and CHROMATICS.

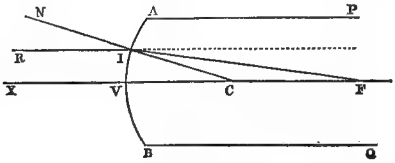


Fig. 5.

**DIORA'MA.** See PANORAMA.

**DIOSCORËA'CEÆ**, a natural order of plants, of which the genus *Dioscorea* (see YAM) is the type. They are twining shrubs, with large tubers, either above or below ground. They are generally classed with endogenous plants; they are among the *Dictyogens* of Lindley. There are about 120 known species. The most important plants of the order are the different species of *Dioscorea* or YAM (q. v.). Black BRYONY (q. v.) is its only representative in the British flora. *Testudinaria elephantipes*, a South African species, sometimes called *Elephants' Foot*, and *Hottentots' Bread*, has a large fleshy rhizome, with a rough cracked bark, which is used as food by the Hottentots in times of scarcity.

**DIOSCO'RIDÉS**, PEDANIUS, or PEDACIUS, a Greek physician, was a native of Anazarba, or Anazarbus, in Cilicia, and flourished in the 1st or 2d c. of our era. He accompanied the Roman armies as physician through many countries, and collected a great store of information and personal observation on plants. In his great work, *De Materia Medica*, he treats of all the then known medicinal substances and their properties, real or reputed, on the principles of the so-called 'humoral pathology.' Two other works bear the name of D., but their genuineness is very questionable. During 15 centuries, D. maintained undisputed authority in botany and in materia medica, an authority which he still holds among the Turks and Moors. The best editions of D. are by Saracenus (Frankf. 1598), and Sprengel (2 vols., Leip. 1829). The *De Materia Medica* has been translated into the Italian, German, French, and Spanish languages. There is also an Arabic translation in MS. in various libraries of Europe.

**DIO'SMA.** See BUCKU.

**DIO'SPYROS.** See DATE PLUM and EBONY.

**DIP**, in Geology, is the inclination of strata downwards into the earth. The amount or angle of dip is the degree of deviation from a level line, or the plane of the horizon. The point of dip is the point of the compass to which the dip is inclined.

**DIPHTHE'RIA**, or **DIPHTHERI'TIS** (Fr. *diphtherite*, from Gr. *diphthera*, a pellicle), a name first applied by M. Bretonneau of Tours, a distinguished French physician, to a form of very fatal sore throat occurring epidemically, chiefly in children, and apt to be confounded both with Croup (q. v.) and with malignant sore throat (*Angina maligna*), as it is found in connection with Scarlet Fever (q. v.). Diphtheria is distinct from both these diseases, not only in its symptoms, but in the character and position of the morbid changes on the mucous membrane. In croup, there is a pellicular membrane, indeed, but it is almost confined to the air-passages, and centres in the Larynx (q. v.); in diphtheria, it usually begins in the pharynx or back of the throat, and often extends down the œsophagus, or gullet. Croup is also a much more decidedly inflammatory disease than diphtheria. Malignant or ulcerative sore throat has even less in common with diphtheria; for in the latter there is no ulceration in the majority of cases, the mucous membrane being merely covered over with a more or less thick veil of false membrane; in both affections, however, there is enlargement of the glands behind the ear and in the neck, generally in the neighbourhood of the parts internally affected. The throat affection in diphtheria is often accompanied by a very low and dangerous form of fever, with great and rapid loss of the patient's strength, which is still further reduced of course by the inability to take food; in other cases, the disease is fatal by suffocation, and tracheotomy has been performed (in some few instances successfully) to relieve the patient from impending death. After the acute disease is over, the recovery may be delayed by paralytic symptoms of various kinds; or simply by extreme debility, with exhaustion and loss of appetite. Diphtheria was supposed by Bretonneau to be contagious, but it is doubted by many whether the evidence of contagion is sufficient. There is no good evidence of any specific cure. The use of the tincture of muriate of iron in large doses (fifteen to twenty drops frequently repeated) has been recommended; also various disinfectants and caustics applied to the throat, as nitrate of silver, hydrochloric acid mixed with honey, and latterly Condy's disinfecting fluid; but all of these have also frequently failed in the hands of experienced physicians. Diphtheria does not appear to be so much under the influence of known sanitary conditions as other epidemics; at least its modes of origin and diffusion are still extremely uncertain.

**DI'PHTHONG** (Gr. having a double sound) means two vowel sounds following one another so closely as to form but one syllable, as in *out*. In this combination the sound is really composed of an *a* as heard in *father*, and a *u* as heard in *put*. Many double vowels in English are not real diphthongs, there being only one sound heard. The spelling of the English language has little or no relation to the pronunciation in this matter. In many syllables written with two vowels, only one sound is heard, as in *bread*. The single vowel letters, again, often have a diphthongal sound; thus the long sound, as it is called, of *i* is really composed of the sound of *a*, as heard in *father*, and that of *e*, in *me;* and *tune* is pronounced as if written *teun* or rather *tyun*. Such words as *bread*, *field*, which are now monophthongs, were doubtless at one time real diphthongs, and are still so pronounced in many parts of England.

**DIPLACA'NTHUS**, a genus of fossil ganoid fishes, peculiar to the old red sandstone, in which six species have been found. The body was covered with very small scales, and the tail was heterocercal. There were two dorsal fins, which with each of the other fins were furnished with a strong spine in front, the base of which was simply imbedded in the flesh, as in the dog-fish, and not articulated, as in the siluroids. The head was large, and the mouth wide, and opening obliquely.

**DIPLOGRA'PSUS**, a genus of fossil zoophytes, differing from the Graptolite (q. v.) in having a double series of cells. They are found in great abundance in the anthracitic shales of the Silurian measures.

**DIPLO'MA** (Gr. *diploō*, I double, or fold). This term originated in the ancient custom of writing solemn documents on two tablets of wax, which were doubled, or laid one upon the other (see DIPTYCH), or on writing material which was folded. The Roman emperors were in the habit of giving diplomas to public servants, and to couriers, to enable them to procure the use of the public servants and horses; hence diploma came to signify a royal charter or prince's letters-patent. The term is now mostly applied to instruments given by universities and other learned societies, in proof of the holder having attained a certain degree; or to the licences held by professional persons to practise their art.

**DIPLO'MACY**, the art of managing the intercourse and adjusting the relations of foreign states, by means of ambassadors, envoys extraordinary, consuls, &c. The principles and rules of diplomacy are embodied partly in those international customs and usages which constitute what may be called common, and in those treaties which may be regarded as statute international law. The diplomatic relations of this country are practically under the superintendence of the Secretary of State for Foreign Affairs, but the power of sending ambassadors to, and receiving ambassadors from, foreign states, is an inalienable privilege of the crown. It was doubted whether an exception had not been made in the case of Rome, by the statutes passed against papal encroachments; and it was thought expedient to remove such doubt by 11 and 12 Vict. c. 108, which authorises her Majesty to enter into diplomatic relations, provided that no person in holy orders in the Church of Rome, or Jesuit, or member of any other religious order, community, or society of that church, bound by monastic or religious vows, shall be received as ambassador at the court of London. Ambassadors are not subject to the municipal laws of the states in which they reside, the theory being that they represent the persons of their respective masters, who cannot be subject to any other laws than those of their own country. If an ambassador offends against the municipal law, or abuses his character, he may be sent home, and accused before his master. Though there was much doubt on the point, this rule seems to extend to crimes against natural law, e. g., to murder, or *mala in se*, as well as to crimes artificially created by the policy of the particular state, *mala prohibita;* and it is now said that the case of Don Pantaleon Sa, the brother and secretary of the Portuguese ambassador, who was executed for an atrocious murder during the protectorate of Cromwell in 1654, was no exception, as he was not 'joined with his brother in the same commission.' See AMBASSADOR, EMBASSY. The arrangement of international ceremonies belongs to the subject of diplomacy. To treat it in detail would lead us far beyond our limits, and we must content ourselves with remarking a few of the customary and conventional modifications which affect the general principle of international law by which all independent states are held to be equal.

*Royal honours* are enjoyed by the empires and kingdoms of Europe, including the Swiss Confederation, the grand duchies of Germany, and, amongst Catholic states, by the pope; and the same right extends to the United States of America. These, along with other rights of greater importance, include the right of taking precedence of the others in all international ceremonials. Amongst those who enjoy royal honours, the order of precedency, after much discussion, was left by the Congress of Vienna on the ancient footing of custom merely. The rule thus fixed is said to be the following: Monarchs enjoying royal honours, but not crowned heads, yield precedence to those who are, whilst they enjoy it over all other monarchs, demi-sovereigns, and rulers of dependent states. This rule leaves the relative rank of the crowned heads and other classes amongst themselves undetermined, and a curious expedient has been found for obviating the necessity of a minuter classification. By what is called the *alternat*, the rank and places of the various powers are changed from time to time in a certain order determined by lot. If there are several parties to a treaty, for example, a corresponding number of copies is made of it, the name of each state being named first in the copy which it preserves, and the others in the order determined by the *alternat*. But the right to alternation has sometimes been a subject of contention. In 1742, it was refused to Prussia by Great Britain; and Hungary and Sardinia had great difficulty in obtaining it at the peace of Aix-la-Chapelle.

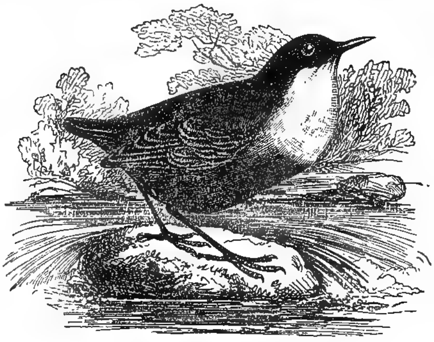
The subject of maritime ceremonies will be treated under its respective heads. They consist of salutes either with cannon, or with the flag or pendant, by furling it, lowering it, or pulling it down. There is also a salute with sails, which generally consists in lowering the foretopsail. Maritime ceremonials are usually made the subject of express compact, but, as a general rule, on the open seas, a ship carrying a pendant salutes a ship of a friendly power carrying an admiral, and detached ships generally salute fleets. It is provided by 22 and 23 Vict. c. 5, repealing in so far 6 Anne, c. 7, that pensions granted for diplomatic services, according to the provisions of 2 and 3 Will. IV. c. 116, shall not disqualify the holder from being elected, or sitting, or voting as a member of the House of Commons.

**DIPLOMA'TICS**, the science of ancient writings. The term can scarcely be said to have been at any time in general use in this country, and even on the continent it has latterly given way to the more convenient and descriptive term, PALÆOGRAPHY (q. v.).

**DIPLO'PTERUS**, a genus of fossil ganoid fishes, four species of which have been discovered in the old red sandstone, and two in the carboniferous series. They have heterocercal tails, with double anal and dorsal fins, opposite each other, but having the dorsal pair a little apart. The head is large and flattened, and the teeth are fewer and larger than in the allied genera. The scales are perforated with small foramina.

**DI'PPEL'S ANIMAL OIL**, called also Empyreumatic Animal Oil, or Rectified Oil of Hartshorn, is prepared by the destructive distillation of bones in close vessels, when BONE-BLACK (q. v.) is left in the retort or vessel, and the crude oil distils over into a suitable receiver. When obtained in this manner, it is a thick viscid oil of a brown colour, and a very disagreeable odour, but on redistillation it may be obtained limpid and colourless. Air and light affect the pure or rectified oil, and render it coloured and somewhat viscid. Its elementary constituents are carbon, hydrogen, nitrogen, and oxygen, and it contains a number of volatile organic bases, such as aniline, picoline, &c. Dippel's animal oil is a powerful medicinal agent, and when swallowed in doses of a few drops, it is antispasmodic, and stimulates the vascular and nervous systems. In large doses, it is a powerful irritant poison.

**DIPPER** (*Cinclus*), a genus of birds of the Thrush family (*Merulidæ*), distinguished from the other birds of that family by an almost straight, compressed, sharp-pointed bill, and still more by their manners and habits. They frequent clear pebbly streams and lakes, feeding chiefly on molluscs and on aquatic insects and their larvæ, which they seek even under water, diving with great facility, and moving about for a short time at the bottom of the water. They carry their rather short tail elevated after the manner of wrens, which they also resemble in their 'frequent becks' or dipping of the head, accompanied with an upward jerking of the tail. One species is found in Britain, the COMMON D., or WATER OUSEL (*C. aquaticus*), a bird rather smaller than any of the British thrushes, of a generally dark-brown colour, with throat and upper part of the breast pure white. It is found throughout the whole of Europe and the north of Asia, but chiefly in hilly or mountainous districts. It is not gregarious. The D. never fails to attract notice, as it sits upon some stone in the midst of or beside the stream, its white breast rendering it conspicuous as it repeats the movement from which it derives its name. It builds a very curious nest of interwoven moss, domed and with the entrance in the side, usually in some mossy bank close by a stream, and often near or under a cascade. The assertion which has been made, that the D. walks without apparent muscular effort at the bottom of the water, is



Water Ousel (*Cinclus aquaticus*).

incorrect; its feet are not well formed for walking, and it moves under water by means of its wings—which are short—not without much muscular effort. The statement also often made, that it eats the spawn of salmon and other fishes, in the belief of which it is much persecuted in Scotland, although not improbable, is not sufficiently authenticated. Other species of D. are found in Asia and North America.

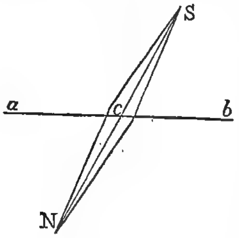


Fig. 1.

**DI'PPING-NEEDLE.** If a magnetic needle be supported so as to be free to move vertically, it does not at most places on the earth's surface rest in a horizontal position, but inclines more or less from it. If the vertical plane in which the needle moves is the magnetic meridian of the place, the angle between the needle and the horizontal line is called the dip or inclination of the needle. Thus, if the needle, NS, be supported at its centre, C, so as to be free to move vertically, the plane of the paper being supposed to be that of the magnetic meridian, the angle NC*a* is the dip. The dip of the magnetic needle at any place can be ascertained with very great exactness by means of the dipping-needle, fig. 2. It consists of a graduated circle, AA, fixed vertically in the frame FF, and moving with it and the vernier V, on the horizontal graduated circle HH. This last is supported by a tripod furnished with levelling screws. At the centre of the circle, C, there are two knife-edges of agate, supported by the frame, and parallel to the plane of the circle. The needle, NS, rests on these knife-edges by means of two fine polished cylinders of steel, which are placed accurately at the centre of the needle, and project at right angles from it: so adjusted, the needle moves with little or no friction. It is so made, moreover, that before being magnetised it remains indifferently in any position; after magnetisation, therefore, the dip which it shews is wholly due to the magnetic influence of the earth.

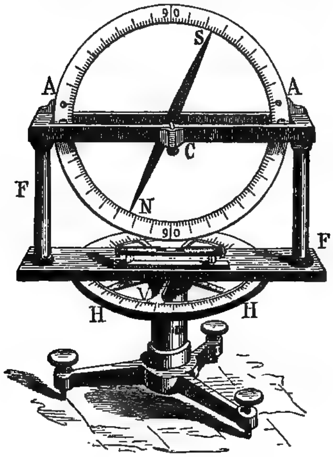


Fig. 2.

In order to understand how an observation is made with the dipping-needle, we must regard the directing force of the earth's magnetism exerted upon the poles of the needle in any vertical plane in which it may happen to be, as resolved into two forces, one acting at right angles to the plane, and the other acting in the plane. There being a corresponding but opposite force at each pole, we have thus two statical couples acting on the needle—one tending to turn it at right angles to the plane in which it moves, and the other tending to bring it round to a position in the plane such that the needle and the forces of the couple may be in a line. In the dipping-needle, the mode of support completely neutralises the first of the couples; and the position that the needle takes in any plane is due wholly to the second. When the plane of the needle is at right angles to the magnetic meridian, the forces of this latter couple act vertically, and bring the needle to the same position. This, then, gives us the means of determining the magnetic meridian, for we have only to bring the vertical circle round till the needle stands at 90° to put it in a plane at right angles to that meridian; and then by moving the vernier on the horizontal circle over 90°, we place the upper circle and needle in the plane of the magnetic meridian. The dipping-needle thus serves the purpose of a Declination Needle (q. v.). In bringing the needle round from the plane at right angles to the magnetic meridian, the dip is less and less, till it becomes least in the plane of that meridian. We might thus also find the magnetic meridian, for it is that plane in which the dip of the needle is least. When the needle is in the plane of the magnetic meridian, the couple which acts in other vertical planes at right angles to them disappears, and the whole force of the terrestrial magnetism acts at each pole of the needle, forming a couple which swings the needle round till it stands in a line with itself. The degree on the circle then pointed to by the needle is the dip at the place of observation. Two readings are necessary, for the reason stated in the Declination Needle. One reading is taken, the needle is then reversed so as to change its supports, and then a second reading is noted, and the mean of the two gives the correct reading. The position of the needle when the dip is read off is manifestly the same that a needle suspended in air, if that were possible, and free to move in any way, would finally assume. In resolving, therefore, the total directive force of the earth as we have done above, we must keep in mind that it always acts parallel to the direction of the dipping-needle.

**DIPSA'CEÆ** and **DI'PSACUS.** See Teazel.

**DI'PSAS** (Gr. a kind of serpent), a genus of non-venomous serpents of the family *Colubridæ*, of very elongated form, and with a thick, broad, and obtuse head. They are tree-snakes, inhabitants chiefly of the warm parts of Asia and America. One species only, *D. fallax*, somewhat doubtfully referred to this genus, occurs in the south of Europe. Some of the species are of great size. The figure represents a large and beautiful species found in Java and Sumatra. The form is more attenuated than in others of the genus.

Dipsas cyanodon.

**DIPSOMA'NIA**, or **OINOMA'NIA**, from the Greek words *dipsa*, thirst, or *oinos*, wine, and *mania*—terms of modern invention, to denote an irresistible or insane craving for alcoholic stimulants, when occurring in a habitual or confirmed form, and requiring confinement or restraint of the person for its cure. Much discussion has taken place in regard to this and other forms of what is often called Moral Insanity; the most recent views of physicians, however, tend to shew that the drinking insanity, or *furor bibendi*, as it was called by an early writer on the subject, is often associated with other forms of mental derangement, and is very apt to be, in connection with one or more of these forms, hereditarily transmitted, even through several generations; so that the really physical or insane character of the craving for stimulants, at least in some cases, may be regarded as a well-established fact in medicine. The legal and general questions in connection with this subject will be discussed under the heads of INSANITY and INTEMPERANCE.

**DI'PTERA** (Gr. two-winged), an order of insects, which received from Aristotle the name it still bears. Its distinguishing characters are so obvious that it has been acknowledged, with little change of its limits, by almost all naturalists. FLY is a popular name very generally applied to dipterous insects, and often with some distinguishing prefix (as House-fly, Flesh-fly, Blow-fly, Bot-fly, Crane-fly, &c.), although it is sometimes used with such prefix to designate insects not belonging to this order (Dragon-fly, Day-fly, May-fly, &c.). Midges, gnats, and mosquitoes are also dipterous insects. In the number of species which it contains, this is one of the most extensive orders of insects: some of the species are also remarkable for the immense multitudes in which they appear; and although most of them are of small size, and few attract us by brilliant hues, not a few are important on account of the annoyance or mischief which they cause, either in their perfect or in their larva state; whilst many of their larvæ (maggots) are also very useful in consuming putrescent animal matter, which might otherwise prove a source of pestilence.

The D. have only two wings, which are membranous and simply veined. A little behind the wings are two small slender organs called *Halteres*, poisers, or balancers, the use of which is not well known. They are usually present even in those exceptional insects of this order in which the wings are not developed. The head of the D. is generally in great part occupied by the large compound eyes, which often contain thousands of facettes; and besides these, three simple or stemmatic eyes (ocelli) are often also present, placed upon the crown of the head. The mouth is formed exclusively for suction, and is usually furnished with a short membranous suctorial proboscis, composed of parts which represent, although so differently modified, the portions of the mouth in coleopterous and other masticating insects, some of the parts, however, often disappearing. The proboscis of many is capable of piercing the skins of animals on the juices of which they feed; others are quite destitute of this power of piercing. Many feed chiefly on saccharine and other vegetable juices. In some genera, the perfect insect seems destitute of a mouth; and the term of life, after the perfect state has been attained, very brief in some, appears to be brief in all. The power which many dipterous insects possess of walking even on very smooth surfaces, in any position, even with the back downwards, familiar to every one in the example of the common house-fly, has not yet received a sufficient explanation. The opinion that their feet are furnished with discs for the formation of a vacuum, has been called in question, but nothing satisfactory has been substituted for it. The terminal rings of the abdomen in the females of many species, form an ovipositor capable of piercing the substances in which the eggs are to be laid, and composed of pieces which may be exserted or retracted into one another like those of a telescope. The eggs are very generally deposited in putrescent animal substances, but those of some kinds in the bodies of living animals, some in vegetable substances; the larvæ of some live in water; the eggs of a few are hatched within their own bodies, and the larvæ of some even remain there till they pass into the pupa state. All the D. undergo a complete metamorphosis. Their larvæ are destitute of true feet, although some of them have organs which serve for the same purpose; some have a distinct head; but others have the head soft and changeable in form, capable of being retracted into the body, and distinguishable only by its position, and by the organs of the mouth. Those which dwell in water or in fluid putrescent matters, have a retractile tail-like prolongation of the body, terminated by a radiated expansion, which communicates with air-tubes, and constitutes part of a very remarkable respiratory system. The larvæ of some D. spin cocoons when about to pass into the pupa state; but in others, the skin of the larva hardens and encases the pupa; the perfect insect finally making its escape by forcing off with its head the end of its pupa case.

**DIPTERA'CEÆ**, or **DIPTEROCARPA'CEÆ**, a natural order of exogenous plants, consisting of beautiful and majestic trees, natives of the East Indies. Some trees of this order, of which about fifty species are known, are highly valuable as timber-trees. Among them is the SAL (q. v.), the most esteemed timber-tree of India. They abound also in balsamic resin, and their resinous products are used for a variety of purposes. See ANIME, CAMPHOR, COPAL, DAMMER, PINY VARNISH, and SAL.—*Dipterocarpus*, the genus from which the above order has received its name, contains several species of the noblest trees of India. They abound in the warm parts of the east coast of the Bay of Bengal and the Eastern Peninsula. The wood is used for house-building, ship-building, &c. *D. turbinatus*, the GURJUN or GOORJUN TREE, the species by which the genus first became known, often attains a height of upwards of 200 feet, and a girth of 15 feet. It has a pale-gray trunk, rising without a branch till it forms at its summit a small symmetrical crown. The leaves are broad, glossy, and beautiful; the flowers in white racemes, but not conspicuous. The wood is hard, close-grained, and durable. A fragrant oil exudes from the trunk, which is extremely valuable for pitch and varnish, and is also used medicinally. It is procured by cutting transverse holes in the trunk, pointing downwards, and lighting fires in them, which causes the oil to flow. The tree is sometimes called the WOOD-OIL TREE. This oil or balsam is also procured from other species of *Dipterocarpus*. *D. trinervis* yields a resin which is valuable for plasters, and acts on the mucous membranes like Balsam of Copaiva. The Javanese smear banana leaves with this resin, which then burn as torches, with a pleasant odour and white light.

**DI'PTERUS**, a genus of fossil ganoid fishes, peculiar to the old red sandstone, in which two species have been found. They derive their name from their most striking characteristic—the double anal and dorsal fins, which are opposite to each other. The head is large and flattened, the teeth subequal, the scales perforated by small foramina, and the tail heterocercal.

**DI'PTYCH** (Gr. *diptuha*), a double writing-tablet, or two writing-tablets, which could be folded together. Herodotus speaks of such a tablet, made of wood and covered with wax. It was in the later Roman time, however, that they were most used, and those which have been preserved belong chiefly to the period when classical was merging into medieval life. The beautiful carving with which they are often covered on the outside, consequently represents not unfrequently a combination of classical and of Christian subjects. Ivory and metal were sometimes employed in place of wood; but the construction was always the same, the wax with the writing being in the inside. Under the emperors, diptychs were distinguished into consular and ecclesiastical. The former, which were presented by the consuls and other magistrates to their friends, and those officially connected with them, on their entrance on office, were inscribed with their names, and bore their portraits. The ecclesiastical diptychs, on the other hand, are decorated with scenes from sacred history, and were preserved in the churches as part of the sacred ornaments. Those that exist are of various sizes, rarely exceeding eight inches by four.

**DI'PUS.** See JERBOA.

**DIRE'CT.** See COLLATERAL.

**DIRECT AND RE'TROGRADE.** In Astronomy, the motion of a planet is said to be direct when the planet goes forward by its proper motion in the zodiac according to the succession or order of the signs (i. e., from west to east), or when it appears to do so to an observer. On the other hand, it is said to be retrograde when it appears to go the contrary way.

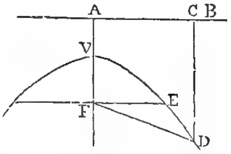
**DIRE'CTOR,** one of a number of persons appointed to conduct the affairs of joint-stock undertakings, such as banks, railways, water and gas companies, fire and life assurance companies, and various kinds of manufacturing and trading concerns. The office of a director is in all cases one of less or more responsibility, sometimes of considerable risk, and according to commercial maxim, ought not to be accepted lightly or for the mere honour which is supposed to be incidental to the position. On this point, unfortunately, there is not a little loose morality and want of due consideration. Men are seen to enter on the office with scarcely a thought of attending to their duty, or of the injury they may inflict by allowing their names to be attached to undertakings in the management of which they cannot be said to take any particular interest. Latterly, so many instances have occurred of the perfunctory performance of the duties of directors, greatly to the damage of those who confided in them, that, perhaps, new and more wholesome views may arise on the subject. As a member of a body incorporated by the legislature, a railway director is bound to administer the affairs of the company only with the means legitimately put at his disposal, nor can he be expected to incur any personal liability to sustain the general operations. Usually, however, when there is any temporary or peculiar shortcoming in the finances, the directors overdraw to a certain extent the company's bank account on their personal responsibility; in all such cases, and where the outlay has been justifiable, the shareholders rarely decline to authorise measures which will relieve the directors of their obligations. In the case of banks, there are usually two kinds of directors—the ordinary and the extraordinary. The ordinary directors are practically the conductors of the undertaking, while the extraordinary attend only on particular occasions, and are, in fact, little else than ornamental appendages, whose names impart a degree of distinction to the concern. As regards bank as well as railway directors, it is the rule that they must respectively possess a certain amount of stock. It is an understanding that the directors of railways, banks, and assurance companies, should be paid in some way for their services. Being mostly men in business, they cannot be expected to give away their time and take trouble for nothing. Their payment, however, in the shape of an *honorarium*, is generally trifling in comparison to the amount of labour which is to be encountered. At meetings of shareholders, small sums are voted to be set aside for the directors, which sums are for the most part appropriated in the ratio of attendance. The fee of a bank director is not unusually half a guinea at each meeting; though it is as customary for those present to divide amongst them the sum set apart for the occasion, wherefore the regular attenders get most. The insignificance of these fees, even where no stinginess prevails, is employed as an argument why anything like a scrupulous examination into affairs is not reasonably to be expected—an argument seemingly of no great moral or legal force; for it is clear there can be no valid excuse for neglecting a trust which has been voluntarily accepted.

The difficult questions as to the cases in which directors incur liability for the losses sustained by the shareholders whose affairs they have undertaken to manage, which are now (1861) occupying so much of the attention of the courts and the public, will be discussed under the head of LIABILITY. Of the statutory provisions as to directors contained in the Joint-stock Companies Acts (the principal act is 19 and 20 Vict. c. 47), the chief are these—1. That the first directors shall be selected, and their number determined, by the subscribers of the original memorandum of association, who shall themselves be deemed directors until other directors are appointed. 2. That his office of director shall be vacated by the acceptance of any other office or place of profit under the company, by bankruptcy or insolvency, or by being concerned in any contract with the company. 3. At the first ordinary meeting after the incorporation of the company, the whole of the directors shall retire from office; and at the first ordinary meeting in every subsequent year, one-third of the directors for the time being, or if their number is not a multiple of three, then the number nearest to one-third, shall retire from office. In every subsequent year, one-third, or other nearest number, who have been longest in office, shall retire. A retiring director shall be re-eligible. 4. The company in a general meeting may increase or diminish the number of directors. 5. Any casual vacancy occurring in the board of directors may be filled up by the directors; but any person so chosen shall retain his office so long only as the vacating director would have retained the same if no vacancy had occurred. The company, in general meeting, may remove any director, and appoint another in his stead. 6. The directors may meet together for the dispatch of business, adjourn, and otherwise regulate their meetings as they think fit, and determine the quorum necessary for the transaction of business. 7. Questions arising are determined by a majority of votes, the chairman having a casting vote in case of equality. 8. A director may at any time summon a meeting of directors. 9. The directors elect their own chairman, and determine the period of his office. In case no chairman has been appointed, or he is absent, the directors shall appoint one of their number to preside for that time only. 10. Directors may delegate their powers to committees of such number as they may judge expedient. 11. The directors must cause minutes to be made in books provided for the purpose. These minutes shall set forth all appointments of officers made by the directors, the names of the directors present at each meeting of directors or of committee, all orders made by meetings or committees, and all resolutions and other proceedings of these bodies. These minutes shall be signed by the chairman, and shall be receivable in evidence of what took place without any further proof. 12. The directors, with the sanction of the company in a general meeting, may declare that a dividend shall be paid to the shareholders in proportion to their shares. No dividend shall be payable except out of the profits arising from the business of the company. 13. If the directors shall declare any dividend when the company is known by them to be insolvent, or any dividend the payment of which would, to their knowledge, render it insolvent, they shall be jointly and severally liable for the debts of the company then existing, and for all that shall be thereafter contracted, so long as they shall respectively remain in office. It is provided that the amount for which they shall be so liable shall not exceed the amount of the dividend declared, and that if any of the directors were absent at the time of making the dividend, or protested in writing, they shall be exempted from liability. Before recommending a dividend, the directors may set aside a reserved fund out of the profits of the company. In companies incorporated for carrying on undertakings of a public nature, such as railways, the appointment, rotation, and powers of directors, are regulated by the statute commonly called 'The Companies Clauses Act,' 8 Vict. c. 16 (for Scotland, c. 17). Two directors are sufficient to sign a contract. The directors have the management and superintendence of the affairs of the company, and may lawfully exercise all the powers of the company, except such matters as are specially directed to be transacted by a general meeting of the company. See LIABILITY (LIMITED) ACTS, JOINT-STOCK COMPANIES.

**DIRE'CTORY.** On the death of Robespierre, in 1794, a reaction commenced in the Convention itself, as well as throughout all France, against the sanguinary excesses of the Terrorists. Ultimately a new constitution—that of the year 3 (1795)—gave birth to a new government, composed of a legislative body divided into two councils—the Council of Five Hundred, whose function was to propose laws; and the Council of the Ancients, whose function was to pass them. The actual executive power was intrusted to five members chosen from both sections, and who sat at the Luxembourg. Their names were Lépeaux, Letourneur, Rewbel, Barras, and Carnot. These five constituted the famous *Directory*. They assumed authority in a moment of immense peril. France was environed with gigantic adversaries, while distrust, discontent, and the malice of rival factions made her internal administration almost hopeless. The frantic heroism of her soldiers saved her from spoliation by the foreigner; and had all the members of the Directory been patriotic and honest, she might have been saved also from spoliation by her own children. But, on the contrary, the home-policy of the Directory was deplorable. The demoralisation which had begun to characterise officials even in Danton's time, now seized almost every class. Barras, a representative of all the turpitude of the hour, set the example. The majority of the two Councils were equally corrupt; and although there were some both in the Councils and Directory whose virtues and talents were unimpeachable, yet they were too weak to counteract the knavery of their associates. It soon became clear that France could not be reconsolidated by the fag-ends of the Revolution. The power and skill requisite for such a herculean work must be sought for elsewhere, among men who had received a nobler discipline than could be obtained in the political squabbles of the metropolis. Such was the thought of the Abbé Sièyes. He turned his eyes to the army, where a host of new and brilliant names had appeared—Hoche, Joubert, Brune, Kleber, Desaix, Massena, Moreau, Bernadotte, Augereau, Bonaparte. Sièyes propounded his plan for the overthrow of the Directory, and the establishment of a consulate, that should be, in reality, a monarchy under republican forms, first of all to Moreau, who was frightened by its audacity; then to Bernadotte, whose excessive caution hindered him from approving of it; then to Augereau, who could not understand it; and finally to Bonaparte, on his return from Egypt. The last admired the project; a conspiracy was rapidly formed; all those functionaries who had been promised places by the Directory, but had not received them, offered their aid; and by the *coup d'état* of the 18th Brumaire (q. v.), an end was put to a government of weakness, immorality, and intrigue. It was succeeded by the Consulate (q. v.).

**DIRECTORY FOR THE PUBLIC WORSHIP OF GOD,** a code of regulations concerning the different parts of public worship, drawn up by the Westminster Assembly in 1644, ratified by the English parliament in the same year, and adopted by the General Assembly of the Church of Scotland and by the Scottish parliament in 1645. It was on express order from both Houses of the English parliament, that the Westminster Assembly addressed itself to the work of preparing this Directory, to supply the place of the Book of Common Prayer, which had been abolished. In Scotland, it was hailed as conducive to 'a happy unity and uniformity in religion among the kirks of Christ in these three kingdoms, united under one sovereign,' and to 'the corroboration of peace and love between the kingdoms.' Many of the regulations of the Directory are still complied with in all branches of the Presbyterian Church in Scotland, but in many things it has been generally departed from; and a disposition prevails in almost all quarters to allow greater freedom and variety in the forms and unessential circumstances of worship; whilst many esteem a departure from the requirement of unnecessary *uniformity* in these things, as tending not a little towards the healing as well as the prevention of divisions, and the establishment of a real *unity*, and even as more consistent with the first principles of Presbyterianism.

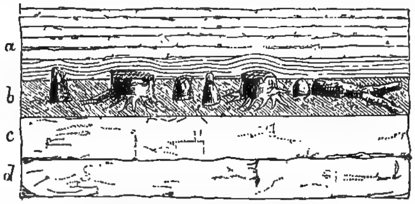
**DIRE'CTRIX** is a right line perpendicular to the axis of a conic section, in reference to which its nature may be defined. Assuming the indefinite line AB in the figure as the directrix, and F a point without it as a focus, then, if the line FD revolve about F as a centre, while a point D moves in it in such a manner that its distance from F shall always be to CD, its perpendicular distance from the line AB, in a constant ratio, then the curve VD, described by the point D, is a conic section, and is an ellipse, a parabola, or an hyperbola, according as FD is less than, equal to, or greater than CD, or FV than VA. The constant ratio referred to is called the determining ratio of the conic.



**DIRK** is a short dagger which at various times and in various countries has been much used as a weapon of offence. In the royal navy, at the present day, it is worn by officers rather for ornament than for use, belted and buckled to the left side.

**DIRK-HA'RTOG ISLAND**, measuring 45 miles by 10, lies off the west coast of Australia, in lat. 26° S., and long. 113° E. Along with two smaller islands to the north, all the three having their lengths parallel with the mainland, it forms the breast-work of Shark's Bay, one of the most commodious inlets on that coast.

**DIRT-BEDS**, the quarrymen's name, introduced into geology, of several layers which occur in the Lower Purbeck Beds (q. v.), having the appearance of black dirt. They rest on the fresh-water beds of the Lower Purbeck, and consist of one principal layer, from 12 to 18 inches thick, and from two to four thinner layers. The substance is, to a large extent, a dark-brown or blackish earthy lignite, being the remains of an ancient vegetable soil. Through it are dispersed, in considerable abundance, rounded fragments of stones from three to nine inches in diameter. Fossil Cycads and Zamias are the predominant vegetable remains; they occupy their original upright position, having become fossil on the spots where they grew. The stumps stand erect for a height of from one to three, or even more feet, and at distances from each other similar to what may be observed in a recent forest. Besides these, the dirt-bed contains the silicified stems of coniferous trees, laid prostrate in fragments three or four feet in length. From the accompanying diagram, it will be seen that the marine oolitic limestone, called Portland stone, was overspread with fluviatile mud, which became the soil on which a forest of Cycads and Zamias grew, and that this was afterwards submerged without any violent agitation, since the layer of black earth has not been abraded, and then was covered with standing fresh water, from which the beds of calcareous mud, now converted into slate, were deposited.



Dirt-bed (Isle of Portland):

*a*, fresh-water calcareous slate; *b*, dirt-bed with stools of trees; *c*, lowest fresh-water beds of the lower Purbeck; *d*, Portland stone, marine.

**DISABI'LITY**, Legal, is either absolute, which wholly disables the person from doing any legal act—e. g., outlawry, excommunication, attainder, alienage—or partial, such as infancy, coverture, lunacy, drunkenness, and the like. It may arise from the act of God, of the law, of the individual himself, or of his ancestor, or the person from whom he inherits.

**DISBA'NDING**, in Military Matters, is the breaking up of a regiment or corps. When peace is proclaimed after a war, and a reduction of the army becomes necessary, this is effected by disbanding or disembodying; the men are discharged, and the officers are mostly placed on half-pay.

**DISBA'R**, the degradation from the rank of barrister-at-law. This power is in England reposed in the benchers of the four Inns of Court. As the courts of law require that every barrister, before he is allowed to practise, must have been admitted to that office by one of the Inns of Court, so they will refuse to hear any one who has been deprived of his rank by the same authority. The power has rarely been exercised, and only when the conduct of the offending party has been grossly irregular. There can be no doubt that the high position held by the bar has been in great measure sustained by the code of honour administered by the Societies of the Inns of Court—a code by which those who are by nature devoid of the feelings of gentlemen are obliged, outwardly at least, to recognise and to observe the demeanour of gentlemen. For some time this wholesome censorship had been exercised with less vigilance than formerly, but a case of disbarring has recently occurred.

In Scotland, the power to disbar rests in the Faculty of Advocates (q. v.).

**DISC**, in Botany, a part intervening in some flowers between the stamens and the pistil. It seems in most cases to represent an inner whorl of stamens variously modified. It is often a mere ring; sometimes it exhibits a whorl of scales or of rudimentary stamens, or even of petal-like appendages; sometimes it rises into a sort of cup around the pistil; sometimes, as in the rose, it assumes the form of a waxy lining of the tube of the calyx. It is often glandular, and secretes a honey-like fluid. It is one of the parts included under the vague comprehensive term *nectary* by the older botanists.

**DISC** and **DISCO'BOLUS**. See Quoit.

**DISCHA'RGE**, from the Military Service, is obtainable occasionally by non-commissioned officers, and rank and file, with the sanction of their commanding officer. Every soldier is engaged for a term of years; and if he quits before the expiration of that time, it cannot legally be without permission asked and obtained. On obtaining his discharge, the soldier pays a sum of money computed with reference to the unexpired period of service. If a soldier has many years still to serve, the discharge-purchase may amount to as much as £20. In the sappers and miners, where the men are all artisans, more or less skilled in mechanical employments, it may even amount to £35; and among this corps, such discharges are very frequent, on account of the value placed on the services of these intelligent men by private employers.

Earl Grey, when Colonial Secretary, introduced the plan of enabling discharged soldiers to settle on a piece of land in the colonies, instead of returning home.

Sometimes this mode of leaving the army is not voluntary. Soldiers are occasionally 'discharged with ignominy,' for some offence that brings dishonour on the corps. In such case, the regiment is assembled, the crime recapitulated, and the sentence read. The buttons, facings, chevrons, medals, and all decorations, are cut from the man's uniform, and he is 'drummed out' of the regiment, if a foot-soldier, or by sound of trumpet, if it be a cavalry regiment. Notice of his degradation is afterwards sent in writing from the War-office to his parents or relations.

**DISCHA'RGING**, in the Royal Navy, is the process of placing a ship 'out of commission.' A regiment of soldiers is permanently in pay, whether engaged in active service or not; but the crew of a ship are paid wages only so long as their names are on the books of a ship 'in commission.' Naval officers, too, are on full pay only so long as they belong to a particular ship in commission.

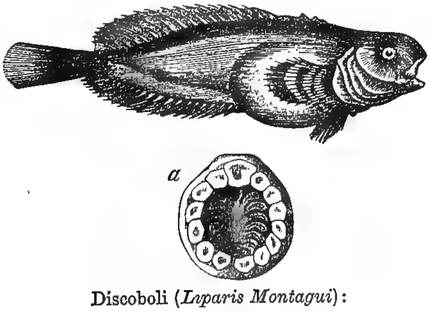
**DI'SCIPLINE**, First Book of, or **OF POLICY**, in Scottish Ecclesiastical History, an important document, drawn up by John Knox and four other ministers, in 1560. Along with the Confession of Faith of the same year, it must be held as exhibiting the principles on which the Reformed Church of Scotland was originally founded. It lays down rules for the election of 'pastors or ministers' by the congregation, their examination by 'the ministers and elders,' &c., also for the election of elders and of deacons; it recognises the office of Superintendent (q. v.) as then established; but it is most largely occupied with things pertaining to ecclesiastical discipline, strictly so called, and the mode of dealing with persons guilty of offences. The First Book of Discipline never received the sanction of an act of parliament, but was subscribed by many of the nobles and barons.

**DISCIPLINE**, SECOND BOOK OF, or 'Heads and Conclusions of the Policy of the Kirk,' a document of great importance in the ecclesiastical history of Scotland, adopted by the General Assembly in 1578; and, although never ratified by act of parliament, still frequently appealed to as the most perfect and authoritative exhibition of Scottish Presbyterianism. The separations which have taken place from the Established Church in Scotland, have not been on the professed ground of dislike to the constitution exhibited in the Second Book of Discipline, but of anxiety for its perfect maintenance; and this document has recently been adopted as one of the articles of union among Scottish Presbyterian churches in Australia. It was prepared with great care by a committee of the General Assembly, in which Andrew Melville took a leading part; and in a time of much conflict between the court and the church, concerning the power of the civil government in things ecclesiastical, church government, and Patronage (q. v.). It begins by asserting strongly the powers regarded as essentially inherent in the church, sets forth the distinctions between civil and ecclesiastical government and their mutual relations, and lays down a thoroughly Presbyterian platform of church-government.

**DISCIPLINE**, in Naval and Military matters, is a general name for the rules laid down for the proper behaviour of the persons employed. The Mutiny Act, the Articles of War, and general orders issued by the Admiralty and the War Office, form collectively the code by which the discipline is regulated. See ARTICLES OF WAR, MUTINY ACT.

In the army, regimental discipline is chiefly maintained by the adjutant. He sees the regimental orders carried out; superintends the drill and field movements; inspects and tells-off all guards, escorts, and parties; regulates all duty rosters, or rollsters; receives garrison orders; keeps regimental books. The adjutant-general is to the whole army what the adjutant is to a regiment, in reference to discipline. In the navy, the discipline is necessarily very strict.

**DISCO'BOLI**, according to Cuvier, a family of malacopterous fishes, remarkable for having the ventral fins united to form a sucking disc on the under surface of the body. To this family, also called *Cyclopteridæ*, belong the Lump-sucker (*Cyclopterus lumpus*), the unctuous sucker or sea-owl or cock-paddle *snail*, and one or two other British fishes. To this family Cuvier also referred the Remora (q. v.), adverting, however, to the different position of the sucking disc, and other important distinctions, on account of which a very different place in the system is now assigned to it. The use of the sucking disc, however, is much the same—that of attaching the animal to fixed substances, so that it may remain and obtain its food, where otherwise it would be swept away by the current. The adhesive power of the sucker, in the larger specimens of the lumpfish, remains after death.



Discoboli (*Liparis Montagui*):
*a*, sucker, on a larger scale.

**DI'SCORD**, sounds which have no harmonical relation whatever; differing from Dissonance (q. v.), which in musical language is applied to sounds that are in grammatically correct relation to each other, though not consonant.

**DI'SCOUNT**, the difference between a sum of money due at a future period and its present value; or the deduction made from the amount of a debt that is paid before it is due. It is usually ascertained —in the case of bills of exchange, promissory-notes, and the like—by subtracting from the principal amount its interest, calculated from the date of payment until the date when the amount is due; but this, although sanctioned by usage, leads to an excess of charge, the interest being thus advanced to the lender before it has actually accrued. True discount is computed as follows: Suppose that £100 is advanced for one year at, say 5 per cent., the sum repayable at the end of the year in respect of this advance will be £105; therefore, £100 is the present value of £105 due a year hence; and from this conclusion it is easily deduced by proportion, that the value of £100 due a year hence is £95, 4*s.* 9¼*d.* Hence the true discount on £100 due in a year at 5 per cent., is £4, 15*s.* 2¾*d.* The usual formulas are—for the present value, $\frac{100\ \text{A}}{100 + nr}$; for the discount, $\frac{\text{A}nr}{100 + nr}$; where 'A' is the principal sum due; '$n$' the time, in years or fractions of a year; and '$r$' the rate per cent., *simple interest being assumed.* For example, let it be required to find the discount on £97, 7*s.* 6*d.*, due seven months hence, at $4\frac{1}{2}$ per cent. Here A = £97, 7*s.* 6*d.* = 97·375, $n = \frac{7}{12}$, $r = 4\frac{1}{2}$; $nr = \frac{7}{12} \times \frac{9}{2} = \frac{63}{24} = \frac{21}{8}$. $\text{A}nr = 97{\cdot}375 \times \frac{21}{8}$.

$$100 + nr = 100 + \frac{21}{8} = \frac{821}{8}.$$

Hence the discount is $\frac{97{\cdot}375 \times \frac{21}{8}}{\frac{821}{8}} = \frac{97{\cdot}375 \times 21}{821}$ $= \frac{204{\cdot}4875}{821} = 2{\cdot}491 =$ £2, 9*s.* 10*d.*

But it is easier first to determine the present value, and hence, by subtraction from the amount due, the discount.

An extension of the above formulas is necessary in computations connected with leases, reversions, &c., to be valued on the stricter principle of compound interest, for which, see INTEREST.

By discount is likewise understood the depreciation in value of a fixed investment; as when a railway share, on which say £100 has been paid, can be sold for £90 only, the 'discount' being thus 10 per cent.

The allowance made to a trader, under the name of discount, for prepayment of a debt, is usually greater than the current rate of interest, as the creditor receiving the money before it becomes due, secures himself against the insolvency of the debtor.

The rates of discount vary according to the demand for money and the nature of the security.

The range in Britain is from 3 to 10 per cent., except in the case of doubtful bills or post-obit bonds, when a much higher rate is exacted. Bills at and under three months' currency are usually charged a per cent. less than those of a long date. In the colonies higher rates are allowed.

**DISCO'VERY**, Bill of, a bill in Chancery (q. v.) which prays the disclosure by the defendant of some matter pertinent to the cause of the plaintiff. By means of bills of discovery, the equity courts formerly possessed an advantage over the courts of common law in extracting evidence from the parties to a suit, who could not be examined as witnesses in an action at law. But by 14 and 15 Vict. c. 99, 16 and 17 Vict. c. 83, and 17 and 18 Vict. c. 125, parties to an action are now competent witnesses, and compellable to give evidence.

**DISCU'SSION**, in Scotch Law. By the law of Scotland, all cautioners, unless bound jointly and severally with the principal debtor, were formerly, and cautioners bound prior to the passing of the Mercantile Law Amendment Act (21st July 1856) are still, entitled to insist that the creditor shall call on the principal debtor in the first place; or *discuss* him, as it is technically said. Where the principal debtor fails to satisfy the obligation in full, the creditor was bound to give the cautioner the benefit of such portion of it as he did discharge. Discussion was not merely a demand for payment, but enforcement of it, in so far as the means of the principal debtor admitted of. Cautioners bound subsequently to the date of the Mercantile Law Amendment Act (19 and 20 Vict. c. 60, s. 6), can enjoy the right of discussion only by express stipulation.

**DISEA'SE**, according to its literal construction, a state of *dis-ease*, or absence of the condition of health, in which all the faculties and organs of the body and mind work together harmoniously and without sensible disturbance. In a strictly scientific sense, there may be disease without pain or uneasiness in the ordinary meaning of these words, but hardly without functional disturbance or incapacity of some kind. It is, therefore, only necessary to include in the definition of disease the diminution of functional power, whether attended or not by suffering, and the scientific and practical ideas of the word will closely correspond. It must be admitted that slight structural and functional deviations from the state of health are sometimes unnoticed; but only because they are slight, and because the functions to which they extend are not habitually in use to the full extent. A great deal of unnecessary obscurity is found, especially in continental writers, in discussing the abstract idea of disease, which has been connected with all the most intangible subtleties of the most abstruse and metaphysical philosophy, by regarding it as dependent upon the idea of life and of the vital force. Many authorities have thus generalised disease into a separate active principle, opposed to, and everywhere seeking to destroy, the principle of health; and Paracelsus was hardly more open to objection on the ground of absurdity than many others of his countrymen, when, in his picturesque and at the same time mystical manner, he endowed the vital principle with a kind of personality, and spoke of disease as due to the whims and caprices of a displeased and resentful Archæus, an idea which was still further developed by Van Helmont. It is common to treat of disease as being *functional* or *organic*, i. e., evidenced by changes of function or of structure; but function and structure are so closely allied in fact and in nature, that the more this distinction is examined, the more vague and impalpable it becomes, and it can therefore only be kept up as a provisional and conventional arrangement. The classification and arrangement of diseases according to their external characters has been termed Nosology (q. v.); while the observation of their more intimate and less superficial relations in connection with their causes and results, is called Pathology (q. v.); both of these sciences, of course, being kept in view in the healing art or Medicine (q. v.), of the more practical portion of which they form the pillars.

**DISEASES OF PLANTS** form a subject of study interesting equally in its scientific and its economic or practical relations, but in regard to the most important parts of which much obscurity and uncertainty still exist. Enough, indeed, is known to shew that, as might have been expected, an analogy subsists between the kinds of disease to which plants are subject and those of animals, both in their nature and their causes, yet with wide differences, according to the difference between vegetable and animal life. Plants, like animals, are liable to suffer from unsuitable external circumstances, as of temperature, drought, or moisture, &c.: they are liable, like animals, to suffer from deficiency of food, from excess of it, or from being compelled to subsist on improper kinds of it, or too exclusively on some particular kind. They often suffer much from vegetable parasites, chiefly fungi, and from multitudes of minute animals, which, without eating them up, destroy organs essential to their health, or prey upon their juices. The constitutions of plants are accommodated to particular temperatures, and they neither flourish when the temperature is for any considerable time much above or much below certain limits, very different, however, for different species. Light is of the greatest importance to vegetable life, and a want or deficiency of it speedily produces an unhealthy condition, the proper chemical changes not taking place in the juices of the plant; and this unhealthy condition, sometimes very extensively produced in gloomy seasons, when the deficiency of light is accompanied with excess of moisture both in the air and in the soil, renders plants very liable to the attacks both of vegetable parasites and of minute animal tribes.

Excess of nutriment, causing an extreme rapidity of growth, sometimes produces an unhealthy condition in particular parts of plants, in which a greater amount of tissue is developed in a single season than can be thoroughly matured.—Manures, injudiciously and unsuitably applied, are often productive of disease. Putrescent matter coming in contact with the roots of many plants, is very injurious to them, and causes *canker*.—Contagion, as a cause of disease in plants, if not fully demonstrated, is rendered highly probable by such facts as the memorable prevalence of the potato disease, and the rapid spread of the vine disease (*oïdium*); nor does the existence of particular fungi in the diseased plants materially affect this probability.

With regard to the diseases of plants generally, little has been hitherto found practicable in the way of cure, and prevention is the object chiefly aimed at in all investigations of their nature and causes.

Some of the most important diseases of plants are noticed under particular heads; and some of the most destructive parasitic fungi are described in their proper places in this work.

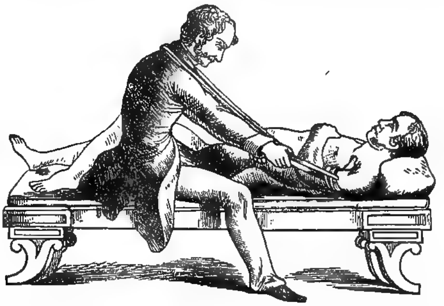
**DISHO'NOUR OF A BILL.** When the drawee, or person on whom a bill is drawn, declines to accept it or to pay it, he is said to dishonour it. The act of drawing or of indorsing a bill implies an obligation to pay it in the last instance, and the person in whose favour it is drawn has thus recourse against the drawer and indorsers, should the drawee fail to accept or to pay. In order to preserve this recourse, however, it is indispensable that notice of dishonour shall be given to the drawer and indorsers. No particular form of notice is requisite. The notice must be such as to identify the bill, and to inform the party to whom it is given of the protest, a copy of which ought to accompany it. If the notice is put into the post-office, and properly addressed, it is sufficient; and even verbal notice, if clear, will suffice. In the case of foreign bills, the period within which notice must be given is regulated by the usages and customs of merchants. Any delay which can fairly be ascribed to neglect or omission, and is not justified by the circumstances of the case, will be fatal to the bill-holder's claim for recourse. In inland bills and notes, the rule till lately in Scotland was, that fourteen days after the protest was taken should be allowed. This has been altered by the Mercantile Law Amendment Act (19 and 20 Vict. c. 60), which provides (s. 14) that notice of dishonour of inland bills and promissory-notes, in order to entitle the holder to recourse, shall be given 'in the same manner and within the same time as is required in the case of foreign bills by the law of Scotland.' To both classes of bills, then, the English rule is now applicable, which is, that notice must, in the general case, be sent the next day, where the parties reside in the same place, and by the next post, if they reside at a distance.

**DISINFE'CTANTS** are a class of substances which have the power of absorbing or destroying the effluvia or fetid odours evolved from putrescent matter, and the miasmatic matter generated in low, marshy, and ill-drained localities. The principal substances capable of being used for this purpose are chlorine, bleaching-powder, animal charcoal, vegetable (wood) charcoal, chloride of zinc, sesquichloride of iron, nitrate of lead, acetate of lead, and nitrous acid. Chlorine (q. v.), either when used by itself, or in combination with lime, as bleaching-powder, is probably the most powerful disinfecting agent. When liberated into an apartment, it immediately causes the destruction of infectious or other deleterious matters. The mode of its action appears to be principally due to the great affinity of chlorine for the hydrogen of the gaseous compounds evolved from putrefying matter, and in abstracting the hydrogen, the chlorine destroys the organic substance. A simple way of employing chlorine as a disinfecting agent in sick-rooms, and adjacent lobbies and apartments, is to place a thin layer of bleaching-powder upon a plate, from which the carbonic acid of the air will liberate chlorine rapidly enough to be of essential service in keeping down infection, and without causing any inconvenience to the inmates. If a more plentiful supply of chlorine be desired, a little vinegar added to the bleaching-powder will liberate the gas freely. Charcoal is also of great service in removing fetid effluvia. Clothes possessing a disagreeable odour may be deprived of it by being rolled up or placed in a box with charcoal; and a thin layer of the latter strewn over putrefying matter, such as the decomposing carcass of an animal, immediately absorbs the effluvia, and the air above becomes quite sweet. The charcoal acts first by absorbing the odoriferous gases, such as ammonia, hydrosulphuric acid (sulphuretted hydrogen), &c., and thereafter aids in the oxidation of these into nitric acid, sulphuric acid, and water. As agents capable of being employed in the deodorisation and purification of offensive liquids, such as bilge-water and sewerage-water, there are chloride of zinc—Burnett's disinfecting liquid (q. v.)—chloride of manganese, perchloride of iron (Ellerman's deodorising fluid), and nitrate of lead (Ledoyen's disinfecting fluid); but these liquids are not true disinfectants, and are merely serviceable in deodorising by *fixation*. The employment of fumigating pastilles, burning brown paper, and fumigations with camphor, benzoin, mastic, amber, lavender, and other odoriferous substances, is merely serviceable in cloaking over the offensive, fetid, and hurtful gases, and should never be resorted to unless in conjunction with the use of other agents possessing the properties of true disinfectants, and especially with the means of effective ventilation.

**DISLOCA'TION** consists in the displacement of one bone from another with which it forms a joint (*put out of joint* being the popular expression). Dislocations are generally the result of sudden accident, but may be the result of disease, or may be congenital. The displacement may be *partial* or *complete;* and surgeons classify their cases into *simple* dislocations, when the skin remains unbroken, and compound, when there is a wound by which the external air may communicate with the joint. Occasionally, in addition to the dislocation, there are fractures of the bones, or lacerations of important blood-vessels in the neighbourhood; it is then termed a complicated dislocation. Dislocation is a rare accident in infancy and old age, because in the former the joint-ends of the bones are very flexible, and yield to violence; while the aged skeleton is so rigid that the brittle bones fracture under force that would drive younger and firmer ones out of their sockets. Dislocations are most frequent between the ages of thirty and sixty. Persons with weak muscles, and lax, long ligaments, or those in whom the latter have been softened by inflammation of the joint, are predisposed to dislocation. The joints most frequently displaced are the shoulder and the elbow.

*General symptoms of a dislocation.*—After a blow, fall, or violent muscular exertion, a limb is found to be immovable at the injured joint, there is great pain, and the shape of the part is changed; but soon swelling ensues, and every distinctive mark about it is obscured. If left alone, or merely treated as an inflamed joint, the swelling gradually subsides; but the immobility continues, the limb is crippled for months or years, when at last nature forms a new socket for the end of the bone, and some amount of useful motion is restored. The proper shape of the part is never restored, but remains an eyesore to the patient, and a disgrace to the surgeon.

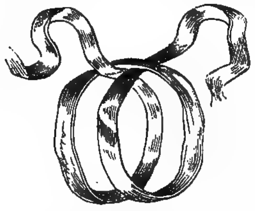
*The general treatment of dislocations* consists in their *reduction*, or pulling the displaced bone back into its place. Its return is opposed by the muscles attached to it, which are stimulated to contraction by the pain of the operation, which requires, of course, a good deal of force to be employed. It is desirable to remove this spasm of the muscles, which is the



Reduction of Dislocation of Shoulder-joint.

great obstacle to the reduction of a dislocation; and in former days, bleeding from the arm, emetics, the warm bath, &c., were generally made use of; now-a-days, chloroform or ether attains the same ends, and renders the treatment of dislocations much more simple and humane than before the introduction of anæsthetics.

When the surgeon is about to reduce a dislocation requiring any degree of force, he fastens the part of the limb above the displaced bone or the trunk, so as to afford him *counter*-extension; he then pulls on the limb either with his hands, or with a bandage or handkerchief attached to it. The best way of fastening this is to roll a bandage, wetted, to prevent slipping, round the limb, and then taking the thing with which he wishes to extend in both hands, he casts it into two loops, forming what is called a *clove-hitch*, and then slips the double noose up the limb till it rests on the wet bandage previously applied. In old-standing cases, the hands grow weary before the extension has been kept up sufficiently long, so it is well to adapt pulleys to draw upon the clove-hitch, as with them the traction can be regulated as the surgeon desires. Sudden, forcible pulling is useless and hurtful, the object being merely to tire out the muscles which resist the attempts at reduction; when they are exhausted, the bone will generally slip back into its place with an audible snap.


Clove-hitch.

A class of shrewd individuals, called '*bone-setters*,' frequently derive profit from some conditions of joints which resemble dislocations. Chronic rheumatic inflammation is occasionally known to fix itself by an accident on some particular joint, especially the shoulder or hip, and may so change the surfaces of the bone-ends that they are spontaneously dislocated; the empiric, naturally antagonistic to the regular practitioner, tells the patient that when he met with the accident the dislocation occurred, but that his doctor overlooked it. Again, many persons who have injured their joints do not submit to having them moved about, after the first inflammation has subsided. The bone-setter gives a forcible bend to the limb, which breaks up the adhesions; and because he has done roughly what the doctor would have done equally well gently, the patient praises him, while he blames the one who guided his joint in safety through the first effects of the accident.

Whenever a dislocation occurs, the nearest medical man should be summoned, even should the mere displacement be rectified at once, because no such accident can occur without some tearing of the soft parts, and it will depend on the after-treatment whether the joint will ever become useful again or not. It must also be remembered, that the sooner a dislocation is reduced, the easier is the reduction. Since the introduction of anæsthesia, however, and the subcutaneous division of tissues, many ancient cases may be improved, and many crippled limbs restored to usefulness.

**DISLOCATION**, or **FAULT**, a term used in Geology to characterise certain displacements common among stratified rocks. The agency that raised these rocks above the waters of the sea, produced in the elevation numerous rents. In their simplest form, the rents are mere cracks, the parts, though separated, remaining contiguous; sometimes a greater or less fissure intervenes between the disunited portions, and this is filled with materials pressed in from above, or with igneous rocks intruded from below. The beds, however, are not always found at the same level—a displacement as well as a severance often takes place, so that the beds on one side of the fissure or crack are many feet, or many hundreds of feet, above or below the beds on the other side with which they were once continuous. One of the best known faults is that called the 'Ninety Fathom Dike' in the Newcastle coal-field. The same beds are 90 fathoms lower on the northern than they are on the southern side. The fissure varies in width from a few feet in some places to more than 20 yards in others: it is filled with sandstone. In the Edinburgh coal-field, the greatest fault is the one known as the 'Sheriffhall Slip.' It has produced a dislocation of the strata to the extent of 400 or 500 feet, so that the coal which is worked on the south side of the slip, near the surface, is on the north side 500 feet below it. Mr Milne Home enumerates 120 faults in the Mid-Lothian and East-Lothian coal-fields. He has himself examined 78 of these, and has found that 35 dip to the south, and 43 to the north; and that while the sum of the down-throws by the faults dipping to the south is 385 fathoms, those dipping to the north have depressed the strata 754 fathoms.

Faults in coal-fields are well known, because of their serious interference with the progress of the miner. But though they often cause considerable labour and expense in searching for the continuation of a valuable seam of coal, they have corresponding advantages, since they disclose on the surface the value of the buried minerals, and when filled with solid materials, they form embankments which confine water, and thus save considerable expense in draining the mine.

The amount of dislocation is the measure of a line drawn from one part of the bed, at right angles to its plane, to a line produced from the other separated part of the bed representing its plane. Thus, in the diagram, AB shews the extent of the down-throw, say 10 feet. Although no notion can be formed, in meeting with a fault, of the extent of dislocation, yet the direction in which the lost strata are to be sought can be certainly determined, for it has been found to be an invariable law, that the strata are lowest on the overlapping side of the slip, so that in the diagram the beds *a*, *b*, *c* are 10 feet deeper in the overlying side than the same beds on the other. Faults have local names from the miners, all of which have been used by geologists. They are called hitches, dikes, troubles, slips, slides, heaves, and throws.

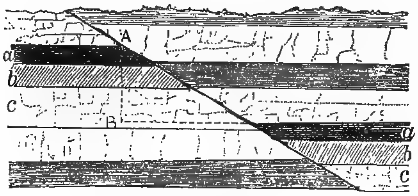


Diagram of Dislocated Strata.

**DISMAL SWAMP**, measuring 30 miles from north to south by 10 in breadth, lies chiefly in Virginia, but partly in North Carolina. In the centre is Lake Drummond, covering about six square miles. Elsewhere the surface is divided between tangled reeds and heavy timber, with a thick undergrowth. This extensive morass has been, at a vast cost, traversed lengthwise by a canal, which connects New Lebanon, in North Carolina, with Norfolk, in Virginia.

**DISMA'NTLE** is the operation which a ship undergoes when to be laid up in ordinary, or placed out of service. She is unrigged; the yards and most of the ropes are removed; and the upper masts taken down.

**DI'SMAS, St**, the name which Catholic tradition has attached to the 'good thief.' He is represented with a cross beside him.

**DISO'RDERLY HOUSE.** See Nuisance, Moral.

**DISPA'RT**, in Gunnery, is a mark set upon the muzzle of a gun, to aid the gunner in obtaining a line of sight truly parallel with the axis of the bore. The dispart, in strictness, is not the mark itself, but a distance or quantity denoted by the mark; and 'to dispart' a gun is to determine this distance. It depends mainly on the relation between the diameter of the breech and that of the muzzle.

**DISPENSA'TION**, a licence granted by the pope for that which is ordinarily prohibited. The nature and limits of the dispensing power have been the subject of much discussion not only in controversy with Protestants, but among Roman Catholics themselves. It is held by the extreme advocates of papal power, that the pope may dispense in any divine law, except the articles of faith; by others, that his dispensing power does not extend to express precepts of the New Testament; some say that his dispensation is valid only when it proceeds upon just cause; some, that it is not properly a relaxation of the law's obligation, but merely a declaration that in the particular case the law is not applicable. The usage of the Church of Rome, however, agrees with the opinions of her theologians in making the pope supreme in releasing from oaths and vows; and a decree of the Council of Trent anathematises all who deny the power of the church to grant dispensations for marriages within the prohibited degrees of the Mosaic law; whilst the multiplied prohibited degrees of the canon law give much occasion for the more frequent exercise of the same power.—Nothing really of the nature of a dispensation is known in any Protestant church. The only kind of dispensations now in use in England, are those granted by a bishop to a clergyman, to enable him to hold more benefices than one, or to absent himself from his parish. Formerly, the pope's dispensations in England, as elsewhere, prevailed against the law of the land, not in ecclesiastical matters only, but in all that large department of civil affairs which, by an interested fiction, was brought within the scope of ecclesiastical government. This abuse was swept away at the Reformation, by 25 Henry VIII. c. 21. The power of the pope was then conferred on the Archbishop of Canterbury, in so far as it was not contrary to the law of God. The granting of special licences of marriage, and the like, is the only form in which it is ever exercised.

In former times, the crown claimed a dispensing power in civil, similar to that which belonged to the pope in ecclesiastical matters. The power was grossly abused by James II., and was consequently expressly abolished by the Bill of Rights. The privilege of granting pardons in capital cases is the only form in which the dispensing power of the crown still exists.

**DISPE'RSION.** Ordinary white light is heterogeneous in its character, being composed of rays of different refrangibility, and the term dispersion is used in optics to denote the separation of these rays by refraction. Transparent media of various kinds possess different dispersive powers, or, in other words, different powers of widening the angle between the red and violet rays, when a ray of white light suffers refraction through a prism of given angle at a given angle of incidence. The circumstance called the 'irrationality of dispersion,' consists in the fact, that when a spectrum is measured after Frauenhofer's manner, it is found that the distance between any of the same two fixed lines of the spectrum has not a constant ratio to the distance between the extreme fixed lines, where different media are used. See Spectrum. It may be noticed that the word dispersion is also sometimes used to denote in Optics irregular reflection or the scattering of light on imperfectly polished surfaces. See Catoptrics. The amount of light not reflected according to the regular law varies with the nature of the reflecting surface. In the case of light incident at right angles upon a surface of common glass, $\frac{1}{13}$ only is properly reflected. In perpendicular reflection at an ordinary silvered looking-glass, about $\frac{1}{3}$ is lost by this sort of dispersion. A little less than $\frac{1}{3}$ is lost in perpendicular reflection from highly polished speculum metal.

**DISPLAY'ED**, in heraldic usage, means *expanded;* as an eagle displayed, or what is vulgarly known as a spread eagle. See Eagle.

**DISPOSI'TION**, in Art, differs from *composition*, inasmuch as the former has reference to the arrangement of the parts, the latter to the effect of the whole.

**DISPOSITION**, in Music, a term now used in organ-building, adopted from the German, meaning the arrangement and combination of the stops on the different rows of keys and pedals, with the pitch of each stop, or length of the lowest CC pipe.

**DISPOSITION**, in the Law of Scotland, is a deed of conveyance, applicable either to heritable or movable property, but most frequently used for the purpose of transferring the former from the seller to the buyer. There is another well-known form of the deed, the object of which is to settle a whole succession, both heritable and movable, a will or testament, in Scotland, being applicable only to movable property. This latter deed is commonly known as a disposition and settlement. The following are the clauses usually contained in a disposition for the purpose of conveying heritable property: 1. The *narrative* or *inductive* clause, in which the names of the disponer and disponee are set forth, the cause of granting the deed is stated, and the receipt of the price or consideration is acknowledged, if the conveyance has been for an onerous cause. 2. The *dispositive* clause, in which the maker of the deed 'sells and dispones,' or 'gives, grants, and dispones,' if there has been no price paid or consideration given. 3. A clause obliging the disponer to infeft. See Infeftment. 4. A procuratory of Resignation (q. v.). 5. A clause of Warrandice (q. v.). 6. An *assignation* to the title-deeds and rents of the subject. 7. An obligation to free the disponee from public burdens due before his term of entry. 8. A clause to the effect that the title-deeds have been delivered to the disponee. 9. A clause of registration. 10. A precept of Sasine (q. v.). And lastly, a Testing Clause (q. v.), in which the deed is authenticated in the usual manner. Though it is still optional to make use of these clauses, they have been greatly shortened by the Act 10 and 11 Vict. c. 48 (1847), and some are entirely dispensed with by the Titles to Lands Act, 21 and 22 Vict. c. 76 (1858). A disposition for the conveyance of movables is a much simpler document. It often bears reference to an inventory containing a more particular enumeration of the effects conveyed. It grants power to the disponee to take possession of the subjects, and it also contains clauses of warrandice and registration, and a testing clause. The disposition and settlement, again, varies in form according to the nature of the property conveyed, and the arrangements which are made with reference to it. Sometimes it is a direct conveyance; in other cases it conveys the property to trustees, to be held and administered by them for the benefit of other parties. In this latter case, it is known by the name of a trust-disposition and settlement. Where contingencies which cannot be foreseen with certainty are anticipated, where the management is complicated by details, or where the operations under the deed are likely to be protracted, the appointment of trustees (see TRUST) is usually resorted to. In either case, the granter's life-interest in the property is reserved by a special clause, and there is also a clause dispensing with delivery. An excellent form, for the guidance of the practitioner in the preparation of this deed, will be found in the *Juridical Styles* (vol. ii. p. 442, 2d ed.). A disposition in security which corresponds to the English mortgage, will be explained under HERITABLE SECURITIES.

**DISRAE'LI, ISAAC, D.C.L.**, a well-known English author, was the descendant of a Hebrew family which flourished first in Spain, and afterwards in Italy. His father, Benjamin D'Israeli, came to England in 1748, entered into business in London, amassed a fortune while yet in middle life, and retiring to Enfield, there died in 1817, aged 90. His son Isaac, born at Enfield in 1766, was educated at Amsterdam and Leyden. He commenced his career as a poet and novelist; but, after the publication of the first volume of his *Curiosities of Literature* (1791), he discovered that his forte lay not in creative literature, but in the illustration of history and literary character, and to this he devoted himself. His style is elegant and pleasing, presenting the fruits of antiquarian research and study without their dryness and general want of connection. No writer is more instructively amusing or amusingly instructive than he. Lord Byron speaks of him as 'that most entertaining and searching writer.' D. died in 1848.

D.'s principal works are the *Curiosities of Literature* (1791—1823; new edition, with Life, Lond. 1851); *A Dissertation on Anecdotes* (1793); *Essay on the Manners and Genius of the Literary Character* (1795, 14th ed., 1850); *Inquiry into the Literary and Political Character of King James I.* (1816); *Commentaries on the Life and Reign of Charles I.* (1828—1831); *Eliot, Hampden, and Pym* (1832); *Amenities of Literature* (1841)—for which he received from the university of Oxford the honour of D.C.L.

**DISRAELI, BENJAMIN, THE RIGHT HON.**, author and statesman, eldest son of the preceding, was born in London 1805; he received a private education, which was carefully superintended by his father. At the age when most other young men who rise to political distinction are sent to a university, he was articled to a solicitor, with a view of qualifying him for a situation in a government office which had been obtained for him by his father. The drudgery of a lawyer's office being distasteful to him, he contributed to a Tory journal, the *Representative*, which came to an untimely end. In 1827, he published his novel *Vivian Grey*, which was succeeded at intervals by other brilliant works of fiction, including *The Young Duke*, *Contarini Fleming*, *The Wondrous Tale of Alroy*, and *Henrietta Temple*. He also wrote the *Rise of Iskander*, a *Vindication of the British Constitution*, and the *Revolutionary Epic*, an epic ridiculing revolutions, and which was universally considered a failure. After visiting Italy and Greece, and extending his travels to Turkey and Syria, he returned to England, to find the country involved in the Reform Bill agitation. His sympathies appear now to have inclined to Radicalism in politics; and having obtained recommendations from Mr Hume and Mr O'Connell, he presented himself in 1832 to the electors of Wycombe, but was defeated. At the general election in 1835, he met with no better success; and leaving Wycombe, he, in April in the same year, contested Taunton on Conservative principles, which he declared to be 'exactly the same principles that he had always professed.' It is, perhaps, needless to state, that the nation at large has failed to observe the consistency of principle which D. claims to have exhibited. He failed to carry his election against Mr Labouchere; and an unfriendly allusion, in one of his election speeches, to Mr O'Connell, brought down upon him a maliciously humorous allusion to his Hebrew extraction, and involved him in a hostile and belligerent correspondence with a son of the Irish Liberator. He again returned to his pen; but in 1837, his desire for a political career being unabated, he was gratified by an invitation to contest Maidstone in the Conservative interest along with Mr Wyndham Lewis. He was elected, and at the age of 32 took his seat in the House of Commons. Claiming the attention of the House with undue precipitation, before he had sufficiently studied its temper, and exciting much laughter by an *outré* manner and extravagant gestures, he was so disconcerted, that he sat down abruptly, but not without uttering the remarkable prophecy: 'I have begun many things several times, and have often succeeded at last. I shall sit down now, but the time will come when you will hear me.' In 1838, Mr W. Lewis died, and in the following year D. married the relict of his late colleague. At the general election in 1841, he did not seek the suffrages of his former constituents, but obtained a seat for Shrewsbury. As the leader of the 'Young England party,' he had now gained the ear of the House, and he became at length the organ of the dissatisfaction with which the landed aristocracy and country gentry regarded Sir Robert Peel's relaxations of the system of protection to native industry. His brilliant invective and polished sarcasm inspired the Protectionist party with fallacious hope and confidence. He denounced the great Conservative minister as the head of an 'organised hypocrisy'—as 'a great middleman who bamboozled one party, and plundered the other'—and as a politician who 'had found the Whigs bathing, and stolen their clothes.' Fortunately, however, such word-mongering could not prevent the triumph of a wise, salutary, and even imperatively required measure. In 1846, when Peel moved the abolition of the corn-laws, D., now M.P. for Bucks, in vain attempted to overthrow the measure. By his energy and eloquence, however, he saved the defeat from becoming a rout, and formed the nucleus of a powerful opposition. On the death of Lord George Bentinck in 1848, D. succeeded to the leadership of the Protectionist party in the Commons, and in the following year called the attention of parliament to the burdens on land and the depression of the agricultural interest. He bore generous testimony to the political consistency and private worth of his predecessor in his *Lord George Bentinck, a Biography*, which had an extended circulation. In 1852, the Earl of Derby, having undertaken the construction of a cabinet, offered him the post of Chancellor of the Exchequer. It was the first time a brilliant novelist had ever figured as the finance minister of a great commercial state, and it argues well for the versatility of his genius that he emerged with honour and credit from the ordeal. His second budget, in 1853, failed, however, to find acceptance with the House of Commons, and the government being outvoted upon it, the Derby cabinet ceased to exist. D. resumed the undisputed leadership of the opposition in the Lower House, from which he was again summoned in 1858, to fill the post of Chancellor of the Exchequer in the second administration of the Earl of Derby. In 1859, he introduced, on the part of the government, a measure of Parliamentary Reform, which, being thrown out, was followed by the resignation of the government. As a debater, he excels in personal invective and sarcasm. Since he has been in parliament, he has written *Coningsby*, *Sybil*, and *Tancred*—novels in which politics and fiction are curiously but not unsuccessfully mingled.

**DISRU'PTION**, the name generally given in Scotland to the famous act of 1843, by which upwards of 400 ministers of the Church of Scotland (nearly two-fifths of the whole) left their churches and manses to vindicate principles which they conceived to be essential to the purity of that church, and in harmony with its earlier history. The word Disruption was probably chosen to indicate that these ministers did not look on their act as a *secession* or *dissent* from the Church of Scotland, but as a *split* or *division* within it, and the body immediately after formed by them assumed the name of the Free Church of Scotland. See FREE CHURCH.

**DISSE'CTION.** See ANATOMY ACT.

**DISSEI'SIN.** See SEISIN.

**DISSE'NTERS**, the common appellation of those who dissent or differ from the established church of their country in any of its doctrines, or in any part of its constitution, and therefore separate themselves from it. Although sometimes employed as a sufficiently appropriate designation of the sects which separated themselves from the general body of the church during the early and middle ages, the term dissenters belongs to modern times and Protestant countries; the claims of the Roman Catholic Church, where dominant, having always been asserted in a manner incompatible with the existence of recognised religious dissent. The measure in which the rights of dissenters are conceded by law, may be esteemed a fair test of the religious liberty enjoyed in a country, and of the general enlightenment of a people. The term dissenters is of English origin and growth, although its almost exact equivalent may be said to have existed in Poland in the name *Dissidents*, a term which first appears in the acts of the Warsaw Confederation of 1573, and there denotes the Polish Protestants, in contradistinction to the members of the established Catholic religion. After 1632, the term Dissidents was applied in Poland to all who were not Roman Catholics, such as Lutherans, Calvinists, Greeks, Armenians, &c.

In England, the term dissenters appears to have come into use in the 17th c., as synonymous with *Nonconformists;* and from England its use was transferred to Scotland in the 18th c., after the Secession (q. v.) Church had been founded in that country. It is usually applied to those who agree with the established church in the most essential doctrines, but differ from it on some minor point, or on questions of church-government, relation to the state, rites, &c.; as in England to Presbyterians, Independents, and Baptists. The claim of the Church of Rome to be regarded as the *Catholic* Church prevents its members from accepting the name dissenters, and others seldom seek to apply it to them. On somewhat similar grounds, it is rejected by *Episcopalians* in Scotland; and for very different reasons, to be found in the peculiar circumstances which attended their growth, the *Methodist* (q. v.) churches are seldom included in it, as ordinarily used. See ESTABLISHED CHURCH, NONCONFORMISTS, PURITANS, SECESSION CHURCH, TOLERATION, &c.

The term Dissenters is not strictly legal or ecclesiastical, those to whom it applies being usually described in legal language by a periphrasis. It may be said to be a convenient term to designate those Protestant denominations which have dissented from the doctrine and practice of the church as by law established. Immediately after the Reformation, dissenters, or nonconformists, as they were then called, were subjected to severe restrictions and penalties. 'During the Rebellion, the laws against Protestant sectaries were repealed; but they revived at the Restoration; and the parliament of Charles II. proceeded to enforce systematically, by new measures of vigour, the principle of universal conformity to the established church.'—Stephen's *Com.* iii. 53. By 1 Will. and Mary, c. 18, the restrictions on dissenters were first relaxed, and certain denominations were suffered to exercise their own religious observances. From that period, various statutes have been passed, each extending in some degree the free exercise of religious opinion. At the present time, dissenters of all denominations are allowed to practise without restraint their own system of religious worship and discipline. They are entitled to their own places of worship, and to maintain schools for instruction in their own opinions. They are also permitted, in their character as householders, to sit and vote in the parish vestries. A dissenter, if a patron of a church, may also exercise his own judgment in appointing a clergyman of the Church of England to a vacant living. See on this subject, Stephen's *Eccles. Law.*

A similar amount of religious liberty is enjoyed in Scotland, not so much derived from or guarded by special statute; fully recognised, however, by decisions of courts, as belonging to the law of the country.

Since the beginning of the 18th c., the Presbyterian, Independent or Congregationalist, and Baptist denominations in England, have been associated under the name of the *Three Denominations.* This association was fully organised in 1727, and enjoys —like the Established clergy of London and the two great universities—the remarkable privilege of approaching the Sovereign on the throne. Notwithstanding much weakness, arising from doctrinal and other differences, this association has contributed much to promote toleration and religious liberty in England.

**DISSEPIMENT** (Lat. *dissepio*, I separate), in Botany, the partition between two Carpels (q. v.) in an ovary or fruit composed of a number of carpels. A dissepiment is formed by the union of the sides of two carpels. Sometimes dissepiments meet in the centre or axis, completely dividing the ovary or fruit into cells; sometimes they are partial, appearing as mere projections from the outer walls of the ovary or fruit, and leaving it one-celled. Many ovaries and fruits exhibit partitions not formed by the union of the sides of carpels: these are sometimes called *spurious dissepiments.*

**DISSOLU'TION OF MARRIAGE.** See DIVORCE.

**DISSO'LVING VIEWS** are pictures painted upon glass, and made to appear of great size and with great distinctness upon a wall by means of a magic lantern with strong lenses and an intense oxyhydrogen light, and then—by removal of the glass from the focus, and gradual increase of its distance—apparently dissolved into a haze, through which a second picture is made to appear by means of a second slide, at first with a feeble, and afterwards with a strong light. Subjects are chosen to which such an optical illusion is adapted, such as representations of the same object or landscape at different periods. Dissolving views were invented and first exhibited as a popular entertainment in England.

**DI′SSONANCE** is the opposite of consonance, and is applied to those intervals in music whose relative proportions are to a certain extent unsatisfactory to the ear, and produce a degree of disquietude. In a special sense, the term dissonance is applied to the interval causing the unpleasant effect; which sound is not always, as some think, the upper note, but may be the middle or the lowest note. Many believe that the feeling of dissatisfaction produced by the dissonances of music, arises from the mind not being able without difficulty to comprehend at once the arithmetical proportions of the vibrations. The foundation of dissonance, however, is generally allowed to be more æsthetical than intellectual, as through the vibrations of a sounding body the air is put into a similar state of vibration, which is communicated to our ear, and so to our whole nervous system, through which we obtain the inward feeling representing the sound. In music, dissonance may be called a necessary æsthetical evil, which is used in the finest musical works for the purpose of producing pleasing contrasts, with their resolutions. In modern music, dissonance is divided into *essential* and *accidental;* the former arising fundamentally, the latter arising from passing notes, anticipations, suspensions, &c. See HARMONY.

**DI′STAFF**, the staff on which the flax or wool is fastened, and from which the thread is drawn in spinning. A distaff of a very elegant construction is represented in art, and was no doubt generally used in antiquity. It is made of a cane-stick, the top of which is slit in such a manner as that the portions, when bent downwards, form a receptacle for the flax or wool. A ring was put over the top, for the purpose of keeping the divided ends of the cane together. The accompanying illustration is from Fairholm's *Dictionary of Terms in Art.* The distaff was dedicated to Pallas; and the Fates are always represented with it, and engaged in spinning the thread of life. It has ever been considered as the peculiar emblem of feminine as opposed to male occupations, and has come to be used figuratively for a woman.

Distaff.

**DI′STANCE.** The limit of view in a picture, or *point* of *distance,* as it is called in perspective, is that portion of the picture where the visual rays meet; the *middle distance* being the central portion between the extreme distance and the foreground. The art of producing on the eye the effect of real distance, in so far as it is not accomplished by mere mechanical rules, is one of the most subtle branches of landscape-painting, and cannot be acquired otherwise than by long experience, and a careful study of the effects of light and shade.

**DISTE′MPER** (Fr. *détrempe*), a coarse mode of painting, in which the colours—of a commoner kind than those usually employed for artistic purposes—are mixed in a watery glue, such as size and whiting. The chief purposes for which distemper is now used are scene-painting and staining-papers for walls. But it is known that the old masters frequently executed pictures and portions of pictures in distemper, and then oiled them, by which means they acquired the character of being painted originally in oil. It is said that Paul Veronese sometimes began his pictures in distemper, and finished them in oil, and that he frequently painted his skies in distemper. Distemper is often ignorantly supposed to be identical with Fresco (q. v.). The difference is, that whilst in the former the colours are laid on a dry surface, in the latter they are put on wet mortar or plaster. See SIZE.

**DISTEMPER** is a typhoid inflammation affecting the upper air-passages of young dogs, and resembling in many respects the strangles of young horses, and the scarlatina and other such complaints of children. Like these, it is generally contagious, occurs only once in a lifetime, runs a definite course, is accompanied by low fever and debility, and is most successfully treated by good nursing and attention to diet and regimen. The eyes are red, weak, and watery; the nose dry and hot; draughts of air or movements of the animal readily excite sneezing or cough; there is dulness, fever, and loss of appetite. The thickened slimy mucus which the inflamed membrane, after some days, secretes, accumulates about the eyes and nostrils, and lodging in the bronchial tubes, prevents the free access of air, and the proper purification of the blood. Hence ensue distressed breathing, increasing weakness, and symptoms of nervous disturbance, such as staggering gait, Chorea (q. v.), and fits. All dogs are liable to distemper, but the delicate, highly bred, and artificially treated varieties suffer most severely, and amongst them the mortality is very great. Bleeding, physicking, and all irritating and reducing remedies, must be carefully avoided, and a good dry bed in a comfortable airy place provided. The stomach, which is generally overloaded, should be relieved of its contents by an emetic, which, for an ordinary sized English terrier, may consist of two grains each of tartar emetic and ipecacuanha, with eight or ten grains of common salt, given in a wine-glassful of tepid water. If no effect is produced, the dose must be repeated in twenty minutes. Constipation, if present, should be corrected by half an ounce each of castor and olive oil, to which, in large dogs, a few grains of gray powder is a useful addition. The febrile symptoms, if acute, may be alleviated by giving four times daily, in cold water, two drops of tincture of aconite, and five grains each of nitre and extract of belladonna. Distressed breathing will be relieved by applying to the chest and sides, for an hour or two continuously, a thick flannel cloth, wrung at short intervals out of hot water. The throat may also be rubbed with hartshorn and oil, and the nostrils sponged and steamed occasionally. Give frequently, and in small quantities at a time, milk and bread, or any other such simple and digestible food; and when recovery is tardy, and weakness ensues, endeavour by nursing, Tonics (q. v.), and Stimulants (q. v.) to support the strength.

The term distemper is sometimes applied to influenza (q. v.) in horses, and epizootic pleuropneumonia (q. v.) in cattle.

**DI′STICH** (Gr. *distichos,* consisting of two rows or ranks) is the classical name given to any two lines, but especially to a hexameter and pentameter, making complete sense. It was much used by the Greeks and Romans as a vehicle for the expression of single thoughts and sentiments; and hence became almost exclusively employed for the classical epigram. The great poets of modern Germany, Goethe, Schiller, &c., have also shewn a fondness for the distich, and remarkable skill in the use of it. A collection of moral maxims in Latin, ascribed to a certain Cato, Dionysius (q. v.), are called *Disticha*, and were highly popular during the middle ages.

**DISTILLA'TION** is an important process in the arts. It consists essentially in converting a liquid into vapour in a close vessel, by means of heat, and then conveying the vapour into another cool vessel, where it is condensed again into a liquid. When applied to a solid, the process is called *Sublimation.* The object of distillation is to separate one substance from others with which it may be mixed. In distillation proper, no chemical decomposition takes place; when any of the substances are decomposed, it is called DESTRUCTIVE DISTILLATION (q. v.). The possibility of separating substances by vaporising them depends upon the fact, that very few substances are volatile at the same temperature. Thus, water boils or becomes rapidly converted into vapour at 212°, alcohol at 173°, sulphuric ether at 94·8, while oil of turpentine must be raised to 318°, and mercury to 662°; and some substances, again, are altogether *fixed.* By applying the proper degree of heat, then, *and no more*, the more volatile of two substances may be expelled from the less volatile; and supposing the vapours of the two to rise mixed, as they are gradually cooled, that of the less volatile will be condensed before the other, thus affording another opportunity of separation.

It is often, however, not so easy to obtain a perfectly pure product by distillation as might at first appear, owing to another fact in chemistry—namely, that many bodies which, when pure, require a high temperature to vaporise them, become more easily vaporised when mixed with substances more volatile than themselves. Owing to this, it is impossible to obtain, by distillation alone, alcohol perfectly free from water. The circumstance, on the other hand, is sometimes turned to good account in another way. By distilling, for instance, parts of plants with water, the essential oils pass over with the steam, and are then separated from the condensed water by other processes.

The applications of distillation are numerous both in chemistry and in the practical arts. Pure water is obtained by distillation, the most of the substances dissolved in natural waters being fixed. Sea-water may thus be rendered drinkable, and there are apparatus for the special purpose. But wherever there are cooking-utensils, a distilling apparatus might be improvised. The pure water that descends from the clouds is produced in a way which is just the process we are speaking of on a large scale. See EVAPORATION. It is no figure of speech to say that the dews are 'distilled.'

The extraction of zinc from the ore is a distillation; the metal, when reduced, passes over in vapour, and is condensed in a separate vessel. When the zinc ore contains cadmium, this metal, being more volatile, comes over in the first portions, and may be removed. When mercury is used to extract particles of gold from sand, the mercury is distilled off from the amalgam, leaving the gold, which is fixed. The mercury being condensed, is again ready for use.

The most extensive application of distillation is in the manufacture of intoxicating spirits, and in ordinary language this is the most common use of the word. Strictly speaking, indeed, the spirits are not produced by the act of distillation; that is done by the previous step of Fermentation (q. v.); and distillation merely separates the spirits from the mixture in which they already exist. But it may be as well to give some account of the whole process under this head.

All the intoxicating drinks used in ancient times seem to have been the products of fermentation merely. The art, as it has been called, of evoking the fiery demon of drunkenness from his attempered state in wine and beer, is a discovery of modern times. It is first mentioned by an Arabian physician of the 11th c., Abulkasem, though the invention is attributed by some to the northern nations. The name *aqua vitæ*, given to distilled spirits by early physicians and alchemists, shews what an estimate they made of the discovery. Raymond Lully 'declares this admirable essence to be an emanation of the Divinity, an element newly revealed to man, but hid from antiquity, because the human race were then too young to need this beverage, destined to revive the energies of modern decrepitude.' Sadly have these anticipations been belied!

Spirits were first distilled from wine, and hence called spirits of wine. An endless variety of substances are now used in this extensive manufacture. Alcohol (q. v.) is the essential ingredient of all spirits, and it results from the decomposition of sugar, which, by the process of fermentation, is resolved into carbonic acid and alcohol. *Sugar*, then, is the direct source of alcohol, and accordingly all vegetable products containing sugar, such as grapes, the sugar-cane, sweet fruits, beet-root, &c., may be used in the manufacture of spirits. But there is another more abundant vegetable substance —namely, *starch*—which is easily convertible into sugar, and thus becomes indirectly a source of alcohol. In malt, and in germinating seeds generally, there is found a substance called *diastase* (q. v.). If a small quantity of this, or of an infusion of malt, be added to a paste of starch, it will in a short time become thin and sweet, the whole of the starch being transformed into sugar. See BEER. It is thus that grain of all kinds, potatoes, and other substances which contain little or no free sugar, are yet capable of yielding alcoholic spirits.

All substances, then, containing either sugar or starch, or both, will yield spirits. With sugar, the manufacture consists of two processes—fermentation and distillation. When starch is the original source, as is more commonly the case in the distilleries of this country, the first step is to convert it into sugar, or to *saccharify* it. This is the object of what is technically called *mashing*, which consists in mixing the materials in a triturated state with water at the temperature of about 160°. It is mostly from barley, oats, and rye that spirits are manufactured; wheat is less used, owing to its cost. Raw grain is ground to meal; malt is only bruised. A certain proportion of malt is always used, even in distilling from raw grain or potatoes, as the diastase of the malt is necessary to set agoing the saccharine fermentation. After being agitated for two or three hours, the saccharine infusion, called *wort*, is drawn off from the grains, and cooled. To this wort is now added a certain quantity of yeast or barm, which induces the vinous fermentation, and resolves the saccharine matter into alcohol and carbonic acid, accompanied by a rise of temperature. The alcoholic mixture which results is called the *wash*, and is now ready for distillation. This takes place in an apparatus called a still, or Alembic (q. v.). In its older and simpler form, the still consists of a copper vessel, into which the wash is put. This vessel is provided with a close head, terminating in a bent tube, which passes, in a spiral form (the worm), through the refrigeratory, filled with cold water. See STILL. When heat is applied to the still, the spirit begins to rise in vapour at 176°, along with more or less steam; these vapours pass through the worm, become condensed by the cold, and drop or trickle in the form of liquid into a receiver. The product of this first distillation in a simple still is called *low wines.* This is then redistilled at a lower temperature, in order to deprive it of part of the water and of the fetid oils that had passed over with the alcohol. To obtain great purity and strength, repeated distillation is used.

A great improvement in distilling was invented in 1801 by a workman of Montpellier, of the name of Adam. By making the vapours arising from the still pass through a series of winding passages, maintained at a determinate degree of heat, and deposit part of their water and other impurities, he was able to obtain from wine a spirit of any required cleanness and strength *at one operation.* This principle has been adapted, by Pistorius of Berlin (1817), to the distillation of the coarser washes of grain and other materials.

Absolute or anhydrous Alcohol (q. v.) cannot be obtained by distillation alone. Rectified spirit, or spirit of wine, for burning in a lamp, still contains, when of ordinary strength, about 25 per cent. of water. Alcohol is considerably lighter than water, its specific gravity being 793 (water, 1000). The stronger any spirit is, then, the less will be its specific gravity; and thus the strength of spirits may be ascertained by an instrument which measures their specific gravity, the *Aërometer* (q. v.) or *hydrometer.* The excise of Great Britain has established one degree of strength as the legal standard, and this is called *proof.* The specific gravity of proof-spirit is 918·6, and it contains nearly equal weights of water and alcohol.

If only alcohol and water passed over in distillation, all spirits, from whatever extracted, would be the same; but this is not the case. Brandy, which is distilled from wine, has a peculiar essential oil derived from the grape, and also some acid; rum is impregnated with an essential oil from the sugar-cane, and with other impurities; malt liquor has the essential oil of barley, &c. It is these essential oils that give to the various spirits their distinguishing flavours. Some of the oils and other impurities are disagreeable and positively noxious; and it is one of the objects of *rectifying* to remove these. The mellowing effect of age upon spirits is owing to the evaporation or spontaneous decomposition of the essential oils. Newly distilled spirits are in general fiery, and specially unwholesome.

Sugar, when fermented, resolves itself into nearly equal weights of carbonic acid and alcohol; a pound of sugar, therefore, should yield upwards of half a pound of proof-spirit. The quantity of spirit afforded by different grains depends upon the proportion of starch they contain: 100 pounds of starch is calculated to yield 35 pounds of alcohol, equal to nearly 8 gallons of proof-spirits. Of the various grains, wheat is the most productive. Taking the average of wheat, barley, rye, oats, and maize, 100 pounds of corn yield 40 pounds of spirit of specific gravity 942 = 3·47 gallons proof. A distiller of malt whisky, says Dr Ure, calculates on obtaining two gallons of proof-spirits from one bushel of malt in ordinary years. The highest yield is 20 gallons per quarter of 8 bushels.

The principal intoxicating beverages produced by distillation are: 1. Brandy (q. v.), which name is applied properly only to spirits distilled from wine. 2. Rum is manufactured from molasses and other uncrystallisable products of the sugar-cane. 3. Corn or malt spirit, under the various names of British spirits, gin, whisky, &c. The Dutch distillers give a peculiar flavour to their spirits (Hollands) by adding a portion of juniper-berries to the other ingredients. From the French name of the juniper, *genièvre,* come *geneva* and *gin.* 4. Spirits from various vegetable substances. In Germany, a great quantity of spirit is distilled from potatoes, which contain about five per cent. of starch. Beet-root and carrots are also used in the same way. The Swedes make a kind of spirit from the sap of the birch, and the maple and other trees are turned to a similar account. We have, besides, cherry-brandy, peach-brandy, cider-spirit, &c. 5. Arrack (q. v.) is the East Indian name for all ardent spirits. See SPIRITS.

**DISTILLATION,** DESTRUCTIVE, is the term applied to the process of heating vegetable and animal substances in retorts or similarly closed vessels, at a temperature sufficient to decompose the original substance, and obtain therefrom products possessing different properties from the material which yielded them. Examples of this process are, the heating of coal in gas-works at a red heat, when it resolves itself into coke, which is left in the retort, and coal-gas, naphtha, tar, &c., which distil over into suitable receivers; the treatment of coal at and below a low red heat, when it yields much paraffine oil; the distillation of wood in close vessels, at a red heat, when charcoal is left in the vessel, and wood-vinegar, wood-spirit, tar, &c., pass over in vapour, and are condensed; and the heating of bones in similar retorts, when animal charcoal is left in the retort, and Dippel's animal oil distils over.

**DISTI'LLED WATER** is the condensed product obtained by the distillation of water. All natural waters, even rain-water, contain certain saline matters (common salt, &c.) in a state of solution, from which they can only be completely freed by the process of distillation. The characters of distilled water are, that it possesses a mawkish, insipid taste, without odour or colour, and when evaporated to dryness in a vessel, it ought to leave no residue. The other properties of distilled water will be noticed under WATER.

**DISTILLED WATERS** are obtained by distilling water along with the parts of plants containing essential oils. Rose-water and lavender-water are familiar examples.

**DISTO'RTION.** The rules of perspective impose certain conditions in the delineation of natural objects, and when the image formed by a lens on the focusing screen of a camera obscura does not fulfil those conditions, it is said to be distorted. The effect of distortion is to render all straight lines, which do not pass through the centre of the lens, curvilinear, and also so to alter the relative proportions of objects in the picture as to be opposed to the principles of true perspective. Distortion, in the camera obscura, is generally produced by the eccentrical incidence of the oblique pencils.

**DISTREI'N.** See DISTRESS.

**DISTRE'SS,** in English law, is the common-law remedy by which a man may remunerate himself for non-payment of rent or other duties, or may impound another's cattle trespassing upon his land. Distress is defined to be 'the taking of a personal chattel out of the possession of the wrong-doer into the custody of the party injured, to procure a satisfaction for the wrong committed.'—Stephen's *Com.* iii. 342. Distress is a remedy of the feudal law. It was an Incident (q. v.) inseparable from the fealty to the lord; so that, as Lord Coke lays down, a lord granting the rent to another, and retaining the fealty, the grantee of the rent could not distrein.—*Co. Litt.* 150 *a.* Distress was incident to every service;

hence it might be put in force for failure to do suit in the lord's court, or for not payment of the duties awarded in a court leet. In modern days, distress is practically enforced chiefly for non-payment of rent, for non-payment of certain public rates, and upon cattle straying upon land not belonging to their master. Cattle so straying may be impounded and retained as security till their owner make satisfaction. Distress for public rates is allowed by the statutes imposing the rates. In this species of distress, and distress for non-payment of rent, the articles are not merely kept as security, but may be sold to pay the amount due. Whatever goods the landlord finds on the premises, even goods belonging to a stranger, may be distreined; but animals *feræ naturæ*, and goods delivered to the tenant by way of trade, may not be taken. A landlord may, by special statute, 11 Geo. II. c. 19, distrein goods fraudulently carried off the premises; and by the same statute he may, with the assistance of the peace-officer of the parish, break open doors to obtain the goods so removed.—See Stephen's *Com.* iii. 341—350.

**DISTRIBU'TION OF SPECIES.** See SPECIES.

**DISTRIBUTIONS,** STATUTE OF, the statute 22 and 23 Car. II. c. 10, explained by 29 Car. II. c. 3. This statute regulates the division of the estate, according to the law of England, of a person dying intestate. A widow is by this act entitled to one-third of the estate in case there are children, the remainder being divided between the children in equal portions. If there be no children, the widow has half, and the other half is divided among the nearest of kin, or their representatives. If no widow, the children take all. If neither widow nor children, the estate is divided amongst the next of kin. In this case, the father (or, if he be dead, the mother) excludes brothers and sisters of the deceased; but by 1 Jac. II. c. 17, the mother of an intestate must take equally with the brothers and sisters of the deceased.

**DI'STRICTS,** MILITARY, are certain regions into which the United Kingdom is divided for military purposes, to facilitate command and organisation. Each has its head-quarters at a particular town. Without defining the districts particularly, they may be denoted as follow. The northern district has its head-quarters at Rotherham; the south-western, at Portsmouth; the western, at Plymouth; all the rest of England forms a district, of which London is the head-quarters. Scotland forms a district, with head-quarters at Edinburgh; while Ireland is in no less than five districts, with head-quarters at Dublin, Armagh, Athlone, Cork, and Limerick.

**DISVE'LLOPED,** or **DEVE'LOPED,** is applied to the colours of a regiment or army, which are said, heraldically, to be disvelloped when they are flying.

**DITCH,** in Agriculture, is a trench usually made along the sides of fields, so that all the drains may be led into it. A hedge is often planted along the side, and the two form a better fence for cattle. In cold undrained lands, the earth thrown out of the trench forms a mound of dry earth, which is particularly serviceable for the growth of thorn-hedges. Accordingly, this is the common mode adopted in planting hedges in such districts, where the subsoil is often close, tenacious, and not well suited for their growth. Various forms of ditches are made, sometimes a double ditch is adopted, and the hedge planted between. In arable lands, however, since the general use of small and large pipes, ditches have been converted into underground drains, which has effected a great saving of land, as well as giving to the fields a tidy appearance.

**DITCH** is one of the most important of the defence-works of a fortified place. It is a broad and deep trench, that may either be kept dry or filled with water; in practice, it is generally dry.

In permanent works, such as the regular fortifications of a town, the *rampart* and the *ditch* are the most important; the former being inside the latter, and formed mainly of the earth excavated from it. The ditch is often 120 feet wide, 12 feet deep below the natural level of the ground, and 24 feet beneath the parapet of the rampart. See COVERT WAY.

**DITHYRA'MBUS,** originally a surname of Bacchus, of uncertain derivation and meaning, was subsequently applied to a species of lyric poetry cultivated more particularly at Athens, and characterised by loftiness and vehemence of style, which, however, at a later period, degenerated into bombast and extravagance. The D. was originally a passionate hymn, sung by one or more revellers to the music of a flute; but Arion (q. v.) invented for it a regular choral or antistrophic form. It is this form which is generally spoken of as the dithyramb. It subsequently received various alterations, but no specimens of it have survived.

**DI'TMARSH,** NORTH and SOUTH (Danish, *Norder* and *Süder Ditmarchen*), the name given to the western district of the Danish duchy of Holstein, lying between the Eider and the Elbe. The entire area is 500 square miles. Pop. 64,000. In old German times, D. formed a part of Saxony beyond the Elbe, and is worthy of special notice, because the inhabitants have preserved to the present day the peculiarities of antiquity. It has its own collection of laws, known as the *Ditmarsh Landbook*, which originated in 1321 from 48 judges; was altered in 1447, first printed in 1497, amended in 1567, and finally enjoined anew in 1711. Whatever authentic notices, traditional and otherwise, we possess of D., we owe to Joh. Adolfi (b. 1559, d. 1629), whose *Chronik des Landes D.* (Ditmarsh Chronicle), written in the Lower Saxon dialect, was published in the original text, with 23 dissertations by Dahlmann (Kiel, 1827).

Dittany:
*a*, top of stem, with leaves and flowers; *b*, fruit.

**DI'TTANY** (*Dictamnus*), a genus of plants of the natural order *Rutaceæ*, having a short 5-partite calyx, five somewhat unequal petals, ten stamens, and five 1—3-seeded follicular capsules cohering at the base. The COMMON D., also called BASTARD D., or FRAXINELLA (*D. albus*), a native of sunny mountains and rocks and dry mountain-forests of the south of Europe, especially in calcareous soils, is very generally cultivated as a garden-flower. It is a perennial, with stem 1½—3 feet high, perfectly unbranched, bearing a few pinnated leaves, which have 3—5 pair of leaflets and an odd one, and terminating in a beautiful erect raceme of 10—20 flowers. The flowers are of a fine rose colour, with darker veins, more rarely white. The plant diffuses a powerful fragrance from its numerous oil-glands when in flower, and during dry hot weather exhales such a quantity of volatile oil, that its sudden combustion makes a slight flash when a candle is brought near it on a warm summer evening. The root is thick, white, and very bitter, and was formerly in high repute in medicine as a tonic stimulant, but is now neglected.—D. of Crete, used as a febrifuge, is a very different plant (*Origanum Dictamnus*) a kind of Marjoram (q. v.).

**DI'TTAY**, a technical term in the criminal law of Scotland, now little used, signifying the ground of indictment or substance of the charge. By *taking up dittay* was understood the collecting of information in order to trial, which is now effected by what is called a precognition.

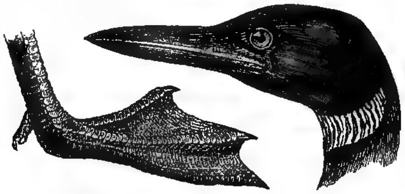
**DÏU′**, a seaport, situated at the eastern extremity of an island of the same name off the south coast of Guzerat, in Hindustan; is well fortified, having a tolerably safe harbour, with a general depth of three or four fathoms. The anchorage, however, is said to be gradually becoming shallower. Pop. of town (1854), 10,858. The place has been in possession of the Portuguese ever since 1515; but, from its detached and isolated position, its trade is of little consequence.

**DIURE'TICS**, medicines having the property of increasing the secretion or excretion of urine, and on this account much employed in dropsies, as well as in a variety of other diseases. The principal diuretics are the salts of potash, especially the nitrate, acetate, and bitartrate (cream of tartar); squill, in powder, vinegar, or syrup; digitalis or foxglove, in powder or infusion; the decoction or infusion of broom-tops (*scoparium*); the decoction of the American winter-green or pyrola; the alcohols and ethers, with most of the volatile oils, especially that of juniper, as in gin; the berries of the common elder; the tincture of cantharides or Spanish flies; turpentine, &c. The last named (from the alcohols onwards in the above enumeration) are more or less irritating in their effects on the urinary organs, and should not be used without due consideration as to the requirements of the particular case. Cream of tartar and the broom-decoction form one of the safest and best diuretic mixtures which can be employed for domestic purposes; or cream of tartar may be given alone, either dissolved in hot water, and allowed to cool, or in substance along with syrup.

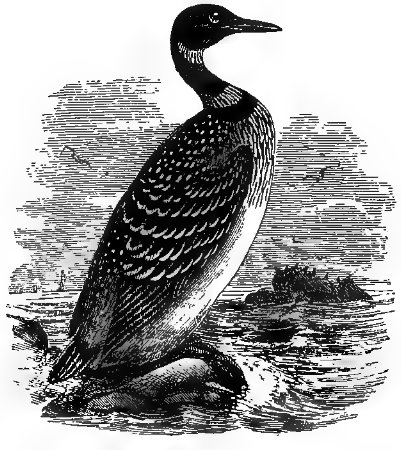
**DIVA'N** is a Persian word, having various significations. It is used in the sense of a muster-roll, a register of payments or account; it is also applied to a collection of poems or songs by one and the same author. Goethe uses it in this sense in his *Westöstliche Divan.* Divan means next an administrative board; the highest council of state at Constantinople is called *Divâni humâjûn*, most illustrious divan. Finally, Divan is the name for the state or reception room in palaces and the private houses of the richer citizens. Along the walls of the room are ranged low sofas, covered with rich carpets, and provided with many cushions. Hence the name divan has been transferred in the west of Europe to a kind of sofa.

**DIVEL ON THE NECK**, an instrument of torture used against the Lollards. It is thus described by Fox, in his *Acts and Monuments:* 'Certain strait irons called the divel on his neck being after an horrible sort devised, straitening and winching the neck of a man with his legs together, in such sort as the more he stirreth in it, the straiter it presseth him, so that within three or four hours, it breaketh and crusheth a man's back and body in pieces.'—Cowel's *Interpreter.*

**DIVER, or LOON** (*Colymbus*), a genus of birds of the family *Colymbidæ* (q. v.), having a strong, straight, rather compressed pointed bill, about as long as the head; a short and rounded tail; short wings, thin compressed legs placed very far back, and the toes completely webbed. They fly well, but are particularly expert in diving. They prey upon fish, which they pursue under water, making use partly of their wings, but chiefly of their legs and webbed feet in their subaqueous progression. They are scarcely capable, however, of walking on land, and the name *Loon* is supposed to refer to this incapacity, and to be from the same root with *lame.* The Great Northern D., or Loon, also called the Immer or Ember Goose (*C. glacialis*), is a bird about two feet and three-quarters long, exhibiting no little beauty of plumage; the upper parts black, spotted with white; the head black, with tints of green and blue; the belly white. It is a winter visitant of the British coasts, even to the furthest south, and is occasionally seen in inland districts; is found in like manner in most parts of Europe, the north of Asia, and North America, as far south as Texas, but it breeds chiefly in the more northern regions, as Labrador, Iceland, and Spitzbergen. It is not exclusively marine, being often seen on large rivers, and making its nest on the shores of fresh-water lakes. Its cry is very peculiar and wild, has been likened to the howl of a wolf, and is in some countries superstitiously regarded as ominous of evil. It is easily tamed, and becomes very familiar.—The Black-throated D. (*C. arcticus*) is another northern bird, of similarly wide geographic distribution, but much smaller size, being only about twenty-six inches in length. It is



Head and Foot of Great Northern Diver.



Great Northern Diver (*Colymbus glacialis*).

found at intervals distributed round the coasts of Britain, and it occasionally breeds in the fresh-water lochs of the north of Scotland. The RED-THROATED D. (*C. septentrionalis*) is also found in all the northern parts of the world, is more common in Britain than either of the other species, and is the bird generally called Loon on the British coasts. In size it scarcely equals the Black-throated Diver. Its back is brownish-black, the belly white, the throat red. The flesh of all the Divers is dark, tough, and unpalatable.—The name D. is sometimes extended to all the *Colymbidæ* (q.v.), sometimes to all the *Brachypteræ* (q.v.).

**DIVE'RGENT.** See CONVERGENT.

**DIVERTIME'NTO, or DIVERTISSEMENT,** a species of musical composition consisting of different movements, arranged in an easy style for one or more instruments, but not so elaborately wrought out as the sonata, or other more regular compositions. The divertimento has generally no fixed character, being merely a musical picture without any attempt at artistic effect, or other aim than to please the ear, and may be said to take its place between the *Etude* and the *Capriccioso*. The divertimento was greatly in vogue during the last half of the 18th century; until then, the word had never been used to denote a musical composition. In France, divertimento is the name given to certain dances and songs introduced between the acts of an opera, or play, for the amusement of the public during the pause, and as such it was used there much earlier than in Italy or Germany.

**DI'VIDEND,** the sum apportioned to creditors from the realised assets of a bankrupt estate, and which is at the rate of so much per pound of the claims. The half-yearly interest on the public funds, and periodical profits on shares in joint-stock undertakings, are also called the dividends, the latter being usually declared half-yearly, by order of the directors. Occasionally the dividends do not exhaust the profits, and the surplus is allowed to accumulate, until it is paid to the shareholders as an extra dividend called a bonus.

**DIVI'DING ENGINE.** See GRADUATION.

**DI'VIDI'VI, or LI'BIDI'BI,** the curved pods of *Cæsalpinia coriaria* (see CÆSALPINIA), a tree which grows on the coasts of Curaçoa, Carthagena, and other parts of tropical America. They have been long used there for tanning, but have recently acquired importance as an article of commerce. A considerable quantity is now annually brought to Britain. Dividivi is one of the most astringent substances known.

**DIVINA'TION** (Lat. *divinatio*), is the act of discovering the hidden, but more particularly the future, in a supernatural way. Men have at all times set their own imaginations above the causes of nature, and by a curious subjective process, have endeavoured to draw out of themselves what could in reality be only derived from a study of the laws of nature. Thus, there have been instituted systems of superstition among almost all nations of the world at one period of their history, which the march of scientific discovery and the beneficent influences of a rational religion have failed to wholly eradicate, so that, even among comparatively enlightened peoples, there lurks a deep substratum of this old-world feeling. A more special use of the term is to denote fortune-telling or sorcery (middle-age Latin *sortiarius*, one who reads the future by means of lots or *sortes*). It was a maxim with the nations of antiquity, that if there are gods, they care for men; and if they care for men, they will send them signs of their will. This, with some variations, has been a universal sentiment in all ages and countries. But it was the first step in this journey which presented the whole difficulty. How was man to know the will of the gods? The variety of answers which this question has drawn forth constitutes the history of divination. Thus, among the Greeks, the word for divination was *mantikē*, which signified more than the Latin *divinatio;* inasmuch as it was applied to any means by which the Deity discloses himself to man, while the Latin word denoted more the power which man is supposed to possess of discovering the future. With the Greeks, the seer was passive; with the Romans, he was active. See SEER and ORACLE. Astrology was a favourite method of divination among the ancient Chaldeans, as well as in the middle ages. *Auguries* and *auspices*—both words derived from *avis*, a bird—were systems brought to perfection by the Romans as means of knowing the will of the gods. See AUGURIES and AUSPICES. The sacrifice of beasts, besides, the casting of the horoscope, and the observing of the constellations, were all favourite modes of guessing at the future practised by the Romans. But the belief was not confined to the Old World. The Araucanians, a warlike nation of South America, seem to have placed as implicit faith in the divination of birds as did the Romans, and they practised this art in a way not very dissimilar. Even among ourselves, the merry-thought bone of fowls is known to possess a curious virtue, and boys need not be told the omens connected with the magpie.

An extensive set of omens have been taken from observing what first happens to one, or what animal or person one meets first in the morning, or at the commencement of an undertaking—the *first-foot*, as it is called. To stumble, has been universally held to presage misfortune. Some semblance of a reason might be found for this belief, inasmuch as stumbling may be supposed to indicate that that self-possession and conscious courage, which are in themselves half a victory over circumstances, are lacking—the want of them, therefore, being half a defeat; but in most cases the interpretation seems altogether arbitrary. The dread of a hare crossing the path seems to be widely prevalent; while to see a wolf is a good omen. This feeling is probably a remnant of warlike times, when the timid hare suggested thoughts of cowardice and flight; while the bold wolf, sacred to Odin, was emblematic of victory. The character of the hare for being unlucky is also connected with the deep-rooted belief, that witches are in the habit of transforming themselves into hares. That to meet an old woman is unlucky, is another very general belief; arising, without doubt, from the same causes that lead to their being considered witches. In some places, women in general are unlucky as first-foot, with the singular exception of women of bad reputation. This belief prevailed as far back as the age of Chrysostom. Priests, too, are ominous of evil. If hunters of old met a priest or friar, they coupled up their hounds, and went home in despair of any further sport that day. This superstition seems to have died out, except in the case of sailors, who still consider the clergy a 'kittle cargo,' as a Scotch skipper expressed it, and anticipate a storm or mischance when they have a black-coat on board. This seems as old as the days of the prophet Jonah.

The observation of *lucky* and *unlucky* days was once an important matter, and was often the turning-point of great events. It is now confined to the one subject of marriage. In fixing the wedding-day, May among months, and Friday among days, are shunned by many people both in the higher and lower orders; for in this matter, which is the exclusive province of women, and in which sentiment and fancy are in every way so much more active than reason, the educated and uneducated are reduced to a level. Perhaps half the superstitious beliefs that yet survive among civilised and Christian communities, group themselves round the subject of love and marriage—of such intense interest to all, yet so mysterious in its origin, and problematical in its issue. The liking or passion for one individual rather than any other, is so unaccountable, that the god of Love has been fabled blind; it is of the nature of fascination, magic, spell. And then, whether happiness or the reverse shall be the result, seems beyond the reach of ordinary calculation. All is apparently given over to mystery, chance, fortune, and any circumstances may, for what we know, influence or indicate what fortune's wheel shall bring round. Hence the innumerable ways of prognosticating which of two or more persons shall be first married, who or what manner of person shall be the future husband or wife, the number of children, &c. It is generally at particular seasons, as at the Eve of St Agnes and Hallowe'en, that the veil of the future may thus be lifted.

Sneezing, likewise, has long been looked upon as supernatural, for this reason, that it is sudden, unaccountable, uncontrollable, and therefore ominous. The person is considered as possessed for the time, and a form of exorcism is used. A nurse would not think she had done her duty if, when her charge sneezes, she did not say: 'Bless the child,' just as the Greeks, more than two thousand years ago, said: 'Zeus protect thee.'

One general remark, however, it is important to make in regard to omens. An *omen* is not conceived to be a mere sign of what is destined to be, it is conceived as causing in some mysterious way the event it forebodes; and the consequence, it is thought, may be prevented by some counteracting charm. Thus the spilling of salt not only forebodes strife, but strife is conceived as the consequence of the spilling of the salt, and may be hindered by taking up the spilled salt and throwing it over the left shoulder.

An important exercise of the diviner's art is to determine the innocence or guilt of parties. This will be treated under ORDEAL. But it would be impossible to enumerate the endless modes of divination for which learned names have been found. Some of the principal are—*Axinomancy* (q. v.), *Belomancy* (q. v.), *Bibliomancy* (q. v.), *Botanomancy*, or divination by means of plants and flowers (it was practised by the ancients, who were wont to bruise poppy-flowers betwixt their hands, under the conviction that they could thereby discover their loves. Hence Theocritus calls the poppy *Teliphilos*, quasi *Deliphilos;* i. e., a *tell-love*. Goethe has made a beautiful use of another form of this superstition, which existed among the Teutonic races no less than among the old Greeks. The child-like Marguerite, in *Faust*, seeks to discover whether or not Faust loves her by plucking the leaves from a star-flower, murmuring alternately, 'He loves me,' 'He loves me not,' and finds to her joy that the *last* leaf comes away while she is saying, 'He loves me'); *Capnomancy* (q. v.), *Cheiromancy* (q. v.), *Coscinomancy* (q. v.), *Crystallomancy* (q. v.), *Cup, Divination by* (q. v.); *Geomancy* (this was anciently practised by casting pebbles on the ground, from which conjectures were formed; but the Arabian geomancy was more recondite, being founded on the effects of motion under the crust of the earth, the chinks thus produced, and the noises or thunderings heard); *Hydromancy*, divination by water or by a mirror, in which the diviner shews the image of an absent person, what he is doing, &c. (this mode of divination plays an important part in the Arabian romances); *Lithomancy*, a species of divination performed by stones, but in what manner it is difficult to ascertain; *Oneiromancy* (see DREAMS); *Pyromancy*, or divination by flame (it was common among the Greeks and Romans: if the flame of the sacrifice was vigorous and quickly consumed the victim, if it was clear of all smoke, and did not crackle, but burn silently in a pyramidal form, the omen was favourable; otherwise, it was not); *Rabdomancy* (see DIVINING-ROD); and *Teraphim* (q. v.)..

**DIVI'NE RIGHT.** A term applied to describe the source of the power claimed for the monarch, by the royalist party, in the great controversies between the monarchical and the parliamentary or commonwealth parties in England in the 17th century. The monarch was held to be the immediate representative of the Deity, to whom alone he was responsible for all his actions—a principle which, of course, relieved him from all human responsibility. The idea was little known in this country until the quiet transfer of the crown from the Tudor to the Stewart dynasty shewed that the hereditary principle was firmly established. It was found by some ecclesiastics in the doctrines of the civil law, which, in imitation of the practice of oriental nations, flattered the Roman emperors by attributing to them a power founded on divine institutions. Throughout a long and miserable contention, divine right was on the one side maintained to be the source of political power, while on the other it was maintained that that power emanated from the will of the people, expressed in what was called 'the social contract.' The chief writers on the side of divine right were Salmasius and Sir Robert Filmer; on the other, Milton, Algernon Sydney, and Harrington. The controversy revived in the discussions which caused the French revolution, long after the settlement of the crown on William and Mary and the Hanover dynasty had settled it in Britain.

**DIVI'NE SE'RVICE**, a tenure by which the tenant was bound to do some special divine service, as to sing so many masses, to distribute a certain sum in alms, or the like. It differed from Frankalmoign (q. v.) in this, that the lord could distrain for the former, not for the latter, which, being an indefinite service, could be enforced only by a complaint to the ordinary or visitor.

**DIVING.** The 'treasures of the deep' have at all times been the subject of much visionary exaggeration, and the accounts of the exploits of divers equally extravagant. We could name a popular school-book, still in extensive use, where children are seriously informed that the pearl-divers of the East acquire by practice the power of remaining under water from 15 to 20 minutes. Such statements are common enough in narratives of ancient date, in some of which the time is extended to two hours. It need scarcely be said that these accounts are absurd, no such endurance being possible. The more skilful divers may remain under water for two, or even three minutes; some modern accounts say four, and even six, but this is very doubtful. In a swimming and diving contest between some North American Indians and Englishmen in a London swimming-bath, one of the Indians, a renowned swimmer and diver, remained under water just one minute and a half, but a London artisan beat him by a few seconds.

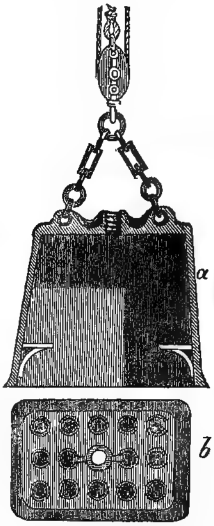
In the *Encyclopædia Britannica*, Professor Faraday describes an interesting fact to which his attention was directed by a gentleman connected with the

Asiatic Society, who, according to Professor Faraday, was the first to make the observation. It was observed that by breathing hard for a short time, as a person does after violent exercise, the breath could then be held much longer than otherwise. Professor Faraday found that he could only hold breath for three-quarters of a minute, if he attempted it without preparation, but that after eight or ten of such forced inspirations, he could hold breath for two minutes. This he explained on the supposition that, ordinarily, a considerable quantity of carbonic acid remains in the involved passages of the lungs, but that it becomes completely expelled by the forced breathing, and its place supplied by atmospheric air. As regards the novelty of the observation, Professor Faraday is mistaken, as the writer of this can testify, for when a boy, he and his companion bathers in the Serpentine, in Hyde Park, commonly practised it. The Red Indian and the artisan above referred to also did the same; it is, in fact, a sort of preparation that a practised diver would make almost instinctively. After a few deep inspirations of this kind, a sense of giddiness is felt, and it is not prudent to carry the experiment far beyond this stage, as a fit of insensibility not unlike apoplexy is apt to result.

This giddiness, which is always produced, and the possible insensibility, indicate a different explanation from that of Faraday. The mere removal of residual carbonic acid from the lungs is not sufficient to explain these; we should rather suggest that all the phenomena result from an excessive oxygenation of the blood, and a consequently accelerated circulation similar to that produced by breathing nitrous oxide. It will be easily understood, that if the blood be forced to take an excess of oxygen, a longer time should elapse before a fresh supply would become necessary—that is, before suffocation would take place; and the giddiness, flushing of the face, and the insensibility, are results to be expected from such an excess.

Most divers suffer severely from the continual efforts in holding the breath; bloodshot eyes and spitting of blood are common among them. This rude mode of diving is now but little used except for pearl and sponge fishing; and even for these purposes, only an uncivilised people, with very little capital and knowledge, would continue to use it, as the modern applications of science afford such immense advantages for all kinds of subaqueous operations, as will be seen by the next article.

**DIVING-BELL.** From what has been stated in the preceding article Diving, it will be at once understood that for all such purposes as subaqueous works upon the foundations of piers, bridges, &c., or the exploration and raising of sunken vessels, the efforts of the unaided diver would be almost valueless, and accordingly various contrivances for supplying air to the diver have been made. The *cacabus aquaticus*, or aquatic kettle, described by Taisnier as having been used by two Greeks in Spain, at Toledo, in 1538, in the presence of the Emperor Charles V. and a multitude of spectators, is one of the earliest reliable accounts of a diving-bell. From his description, this must have been similar in principle and construction to the modern diving-bell, but of clumsy dimensions, and wanting in efficient means of renewing the supply of air. Dr Halley's diving-bell, about 1720, was a wooden chamber of about sixty feet internal capacity, open at the bottom, where it was loaded with lead, to keep it perpendicular in its descent. Strong pieces of glass were set in the upper part, to admit light. Casks filled with air, and loaded with lead, were let down with the bung-hole downwards; and from these a supply of air was drawn by means of a hose. The form of diving-bell now in use was first constructed by Smeaton for the works at Ramsgate harbour, 1788. It was of cast iron, and weighed 50 cwt.; its height, 4½ feet; length, the same; and width, 3 feet. It sunk by its own weight, and was lighted by stout pieces of bull's-eye glass, firmly cemented in brass rings near the top. The principle of the diving-bell will be easily understood by floating a piece of lighted candle or a wax-match on a cork, and then covering it with an inverted tumbler, and pressing it downwards; the candle will descend below the level of the surrounding water, and continue burning for a short time, although the tumbler be entirely immersed. The reason is obvious enough: the air in the tumbler having no vent, remains in it, and prevents the water from occupying its place, so that the cork and candle, though apparently under water, are still floating, and surrounded by the air in the tumbler; the candle continues burning until the oxygen of the air is exhausted, and then it goes out, as would the life of a man under similar circumstances. If vessels full of air, like the barrels of Dr Halley, were submerged, and their contents poured into the tumbler, the light might be maintained; but this could be better done if a tube passed through the tumbler, and air were pumped from above through the tube into the tumbler.



Diving-bell:
*a*, section shewing inside;
*b*, top.

The modern diving-bell, which is made of cast iron like Smeaton's, is supplied with air in this manner. It must be remembered that air is compressible, and diminishes in bulk in proportion to the pressure, so that at a depth of about 33 feet in water, it would occupy half the space it filled at the surface; if the inverted tumbler were carried to this depth, it would be half-filled with water. A considerable quantity of air has, therefore, to be pumped into the diving-bell, merely to keep it full as it descends; the air thus compressed exerts a corresponding pressure, and would rush up with great force if the tube were open and free. This is prevented by a valve opening downwards only. When the diving-bell has reached its full depth, the pumping is continued to supply air for respiration; and the redundant air overflows, or rather *under*-flows, by the open mouth, and ascends to the surface in great bubbles. The diving-bell is provided with a platform or seat for the workmen, and suspended from a suitable crane or beams projecting from a barge or pier; men above are stationed to work the pumps, and attend to the signals of the bellman. These signals are simply made by striking the sides of the iron diving-bell with a hammer, and as sound is so freely communicated through water, they are easily heard above. One blow signifies 'more air;' two blows, 'stand fast;' three, 'heave up;' four, 'lower down;' five, 'to eastward;' six, 'to westward;' &c. These, of course, may be modified as agreed upon. Messages are also sent up, written on a label attached to a cord.

The sensations produced in descending are rather curious. Immediately on the mouth of the diving-bell striking the water, a feeling like a slight blow on the internal ear is produced; a dull ringing in the ears and a sense of deafness follows.

The workmen accustomed to subaqueous existence do not suffer these inconveniences; novices feel pains in the head and ears, but these pass away after a short initiation. It is stated that one man who had suffered from difficulty of breathing was completely cured by 'belling,' and that deafness is not produced by it, but, on the contrary, is in some cases relieved.

**DI'VING-DRESS.** In Schott's *Technica Curiosa*, published in 1664, is described a *lorica aquatica*, or aquatic armour, which consisted of a leathern dress, to protect the diver from the water, and a helmet. In 1721, Halley describes a contrivance of his own of nearly the same kind; its object was to enable the diver to go out from the bell and walk about, he was to be provided with a waterproof-dress, and a small diving-bell, with glass front, as a helmet over his head, which was to be supplied with air by means of a tube from the diving-bell.

The modern diving-dress is made of Indian-rubber cloth; a strong metal helmet, with round pieces of plate-glass in front, rests upon a pad on the shoulders; the air is supplied to this helmet from above, in the same manner as for the diving-bell, but instead of the waste air passing out below, a second tube carries it up. Leaden weights are attached to the side of the diver, and thus he may descend a ladder and walk about below. He carries with him one end of a cord communicating with the assistants above, and by pulling this, as agreed upon, makes a series of signals.

**DIVI'NING-ROD**—often called the *Virgula Divina*, the *Baculus Divinatorius*, the Caduceus or wand of Mercury, the Rod of Aaron, &c.—is a forked branch, usually of hazel, and sometimes of iron, and even of brass and copper, by which it has been pretended that minerals and water have been discovered beneath the surface of the earth. The rod, when suspended by the two prongs, sometimes between the balls of the thumbs, will distinctly indicate, by a decided inclination, it is alleged, the spot over which the concealed mine or spring is situated. Other powers are ascribed to the divining-rod, but this is the chief. Many men, even of some pretensions to scientific knowledge, have been believers in the occult power ascribed to this magic wand. Agricola, Sperlingius, and Kirchmayer, all believed in its supernatural influence. So did Richelet, the author of the Dictionary. The learned Morhoff remained in suspense, while Thouvenot and Pryce, in the latter part of the 18th c., gave ample records of its supposed power. Bayle, in his Dictionary, under the word *Abaris*, gives some ingenious arguments both for and against the divining-rod. In a work published by Dr Herbert Mayo in 1847 and 1851, entitled, *On the Truth contained in Popular Superstitions*, he gave some curious illustrations of the art, supposed to be possessed by one in forty of the Cornish miners. At Weilbach, in Nassau, he likewise met with one Edward Seebold, who, he says, possessed the power, but afterwards lost it. Arthur Phippen, in 1853, published a pamphlet containing an account of two professional diviners or dowsers. One of them, named Adams, gave remarkable indications of being able to detect water underground. He not only was able to discover the particular spot where water might be found, he could even perceive a whole line of water running underground.

Scientific men, who have bestowed any care on the examination of nature, regard this alleged power of the divining-rod as an unconscious delusion, ascribing the whole phenomenon to the effect of a strong impression on the mind acting through the agency of the nerves and muscles. See ANIMAL MAGNETISM.

**DIVISIBI'LITY** is that property of quantity, matter, or extension, through which it is either actually or potentially separable into parts. Whether matter is or is not indefinitely divisible, is a question which has occupied the minds of philosophers since very early times. See ATOM. There is no doubt that, abstractly speaking, it is indefinitely divisible. We cannot conceive any body or space so small but that we can subdivide it in imagination, and thus figure to ourselves bodies and spaces still smaller; and practically, we know that the subdivision of matter is carried in nature far beyond appreciation either by our senses or by calculation. The diffusion of odours through the air for long periods from odoriferous bodies without their suffering any sensible change of weight, and the tinging of great quantities of fluid by very minute portions of colouring matter, are cases commonly appealed to in proof of the extreme fineness of certain material particles; while, by experiment, it is shewn that there is no practical limit to the divisibility of even the most solid substances. Thus, an ounce-weight of silver, gilt over with eight grains of gold, has been drawn out into a wire 13,000 feet long, which was all its length covered with the gold; and a tube of glass presented to the blow-pipe has been drawn out till it became as fine as a silk fibre, or $\frac{1}{2500}$th of an inch thick, still retaining its character as a tube with a distinct interior and exterior surface. In fact, in theory, great and small are mere terms of relation; under the microscope, objects invisible to the eye appear of considerable bulk; and as Sir John Herschel, in his celebrated *Introduction to the Study of the Physical Sciences*, has put it, there is no reason why a mote in a sunbeam should not be in itself a world. With regard to the indefinite divisibility of space, it may be demonstrated geometrically; and perhaps, after all, it is the feeling that space is infinitely divisible, which compels our minds most strongly to resist the notion of ultimate atoms with definite forms, as conceived in the corpuscular theory.

**DIVISIBILITY**, in the Theory of Numbers, means the capability of any number of being divided by another without remainder. To find the condition of divisibility of one number, N, by another, D. Let $N = b_m r^m + b_{m-1} r^{m-1} + \ldots b_1 r + b_o$. See NOTATION. Then $N = b_m (D + \overline{(r - D)})^m + b_{m-1} (D + \overline{r - D})^{m-1} + \ldots + b_1 (D + \overline{r - D}) + bo$. Expanding the different terms of the right-hand side of this equation, it will appear that $\frac{N}{D}$ will be a whole number, if $b_o + b_1 (r - D) + \ldots + b_m (r - D)^m$ be divisible by D. Hence, if $r = 10$, or the number be in the denary scale, and $D = 9$, and therefore $(r - D) = 1$, any number will be divisible by 9, if $b_o + b_1 + b_2 + \ldots + b_m$ is so, or if the sum of its digits is divisible by 9.

**DIVI'SION**, one of the four principal rules of arithmetic, is that by which we find how often one quantity is contained in another. It is a compendious method of subtraction, by which we can at once take one number from another as often as it is contained in it. There are three numbers concerned in division: the dividend, or number to be divided; the divisor, or that by which the dividend is to be divided; and the quotient, or the number expressing how often the divisor is contained in the dividend.

The symbols of division are $b\,)\,a$ (, $\frac{a}{b}$, or $a \div b$, where $a$ is the dividend, and $b$ the divisor.

There are various methods of division, such as the English, Flemish, Italian, Spanish, German, and Indian methods, which differ merely in the manner of arranging and disposing the numbers. The English method will be found explained in all the ordinary text-books of arithmetic. There are also rules of division for the division of integers, fractions, and algebraical quantities. The general rule for the division of vulgar fractions is, to multiply the one by the reciprocal of the other. The division of decimal fractions is performed in the same way as the division of integers. And, in algebra, division is practically performed as in arithmetic, either by making a fraction of the dividend and divisor, and reducing the numerator and denominator by the parts common to both, or else by dividing the former by the latter, after the manner of long division. See any text-book on Algebra. For division by logarithms, see Logarithms.

**DIVISION**, Benefit of. By the law of Scotland, co-cautioners are each ultimately liable for the whole debt which they have guaranteed. Each, however, is liable only for his own proportion, so long as the others are solvent, provided he has not expressly renounced that privilege, or is not bound conjunctly and severally with the principal debtor, and the debt must thus be divided amongst them. The law of division is not affected by the Mercantile Law Amendment Act; and it is therefore necessary, where there are more cautioners than one, that all should be proceeded against.

**DIVISION**, in Military matters, is one section of an army, indefinite in point of numbers, but established as a matter of convenience. It comprises infantry, cavalry, and artillery, and is in effect a small army in itself, commanded by a general officer. In the Crimean war, for instance, a British division comprised two brigades, each of three or four battalions.

**DIVISION**, Naval, is a secondary group of ships in a large fleet, generally three to a squadron. In a very large and complete fleet, there may be as many as nine admirals or flag-officers commanding nine divisions, in three squadrons of three divisions each. A red, white, or blue flag denotes the squadron; while the mast on which this flag is hoisted denotes the particular division of this squadron.

**DIVISION OF LABOUR**, or **DIVISION OF EMPLOYMENT**, a term often used by political economists to express a means by which labour is economised, or, as another method of stating the same result, by which production is increased. The problem in division of labour is so to adjust matters in any given community that each member of it shall work, or be able if he pleases to work, with the greatest possible results. In practice it is, like most other arrangements, apt to be too broad or too narrow. The old term, 'jack of all trades and master of none,' expresses the truth, that people who try too many things are not likely to be adepts in any. On the other hand, few people can do any sort of work to great perfection, unless it is part, as it were, of a group of functions for which they are more or less prepared. A good dentist will be in some measure a surgeon; a conveyancer or a special pleader will know something of the other departments of legal practice; a shipwright will be able, on occasion, to do other kinds of carpentry, and he will be the better of a general knowledge of the mechanical powers. That division of labour, in fact, which is really productive, is where a man who can do several things selects one as that which he can do best, or has most opportunity of doing. By constant practice at that one thing, and the withdrawal of his attention from other matters, he achieves perfection and rapidity of execution. There is an important difference between this selection of a special pursuit, and the inability to do anything more than one thing, which is often confounded with it. In the former case, the worker, whether with head or hand, has great resources, for his adopted pursuit is the best, out of several others, on which he can fall back. The man who can do only one thing is in a precarious condition, because that one thing may be superseded. Indeed, as the one thing which can be so done is generally a very simple thing, it is almost a law in political economy that it will come to be superseded by machinery. Such was the fate of the hand-loom weavers, whose function, especially in the plainer and lighter fabrics, was too easy to last. Of the division of unskilled and easy labour, there is an excellent illustration in Adam Smith's description of pin-making: 'One man draws out the wire, another straights it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving the head; to make the head requires two or three distinct operations; to put it on is a peculiar business; to whiten the pin is another; it is even a trade by itself to put them into a paper; and the important business of making a pin is in this manner divided into above eighteen distinct operations, which in some manufactories are all performed by distinct hands.' This division was doubtless useful, so long as pins were made entirely by human hands. It prompted serious inquiries, however, how far such functions were of an improving or a deteriorating character, and essays were written to prove that in manufacturing countries human beings were deteriorating, as no one of them had the faculty of self-support in separation from his fellows, and none could even make one single article by himself, all being dependent for their bread on a complex co-operation, which might break down any day. The answer to such fears may be found in the pin-making of the present day, where one man tends a machine, feeding it with wire at one end, while the pins drop out at the other. This, too, is the fruit of division of labour, for many skilful heads and hands have been occupied in bringing to perfection the different parts of the machinery. It is of the highest importance to the working-classes of a country, to keep in view that though the division of labour does sometimes create functions which, while they are extremely simple and easy, are of value as helping other functions to go on, yet this kind of easy and uniform work has no stability in it, and the possession of the facility for doing it acquired by practice is no permanent industrial endowment, since it is pretty sure some day to be superseded by machinery.

**DIVI'SOR.** See Division. See also Prime Numbers.

**DIVO'RCE**, is defined by a Scottish writer to be 'the disruption, by the act of the law, of the conjugal tie, made by a competent court on due cause shewn.'—Fraser, *Pers. and Domestic Relations*, i. 645. This definition correctly expresses the law of divorce as it now stands in the United Kingdom. There are some differences of detail in the working of the law in England and Scotland, which will be noticed below.

The desire to obtain a release from the matrimonial bond has existed at all times and under all legal systems. In heathen nations, this release was often granted on the slightest grounds. Even among the Romans, marriage was regarded as little more than a conventional union, to be observed so long only as it suited the mutual convenience of the spouses. Christian nations, on the other hand, adopting as the basis of their systems the Scriptural law, as declared Matt. xix. 9, Mark x. 9—11, Luke xvi. 18, and 1st Cor. vii. 10, 11, are agreed in considering marriage a sacred tie, not to be dissolved except on the ground of unfaithfulness to the marriage vow. Even this limited ground for dissolution of marriage is denied by a large portion of the Christian world. By the civil law, as it existed for some centuries after Christianity, a greater laxity was allowed in regard to divorce. The Emperor Constantine was the first to prohibit dissolution of marriage by simple consent of the parties. This practice was again revived under the Emperors Theodosius and Valentinian; and though those emperors subsequently rescinded this edict, yet the rule as to the grounds on which marriage might be dissolved continued to fluctuate. By the canon law, marriage was regarded as a sacrament; and though marriages contracted in disobedience to certain rules might be declared null *ab initio*, a marriage validly contracted would not be dissolved except by papal dispensation. But the rule of the canon law was not uniformly adopted by the states of Europe, and it was not till the famous Council of Trent issued a decree, in its 24th session, in 1562, declaring marriage indissoluble even after the adultery of one or both of the parties, that a uniform rule on the subject was established. But before this decree was issued, the reformation had made progress throughout Europe, and thus a change again took place in regard to the law of divorce. It should be observed, that though by the canon law divorce *a vinculo matrimonii* was unattainable, parties might obtain a separation *a mensâ et thoro.* The nature of this remedy will be explained below.

Roman Catholic countries adopted the principle laid down by the Council of Trent, and this rule continues to be in force in most countries which are in the Roman Catholic communion. But by the Code Civile of France, divorce is allowable on the ground of adultery and certain other causes. Countries which adopted the reformed religion, have varied greatly in the rules established in regard to the question of divorce. In Holland, divorce is permitted on the ground of adultery and desertion. In America, the practice varies in different states. 'In several of them no divorce is granted but by special act of the legislature, according to the English practice; and in others, the legislature itself is restricted from granting them, but it may confer the power on courts of justice. So strict and scrupulous has been the policy of South Carolina, that there is no instance in that state since the revolution of a divorce of any kind, either by sentence of a court of justice or by act of the legislature. In all other states, divorce *a vinculo* may be granted by courts of justice for adultery. In New York, the jurisdiction of the courts as to absolute divorce for causes subsequent to marriage is confined to the single cause of adultery; but in most of the other states, in addition to adultery, intolerable ill-usage, or wilful desertion, or unheard-of absence, or habitual drunkenness, or some of them, will authorise a decree for divorce *a vinculo* under different modifications and restrictions.'—Kent, *Comm.* iv. 105. In England, previous to the passing of the late Divorce and Matrimonial Act, marriage was by the common law indissoluble. It was, indeed, competent to obtain a declaration of nullity of marriage on the ground of relationship, previous marriage of one of the parties, mental or physical incapacity, or coercion. But the judgment so obtained was not a decree of divorce, but a declaration that the marriage tie between the parties had never really been contracted. In certain cases of adultery, a remedy was obtained by means of an act of parliament, passed for each special case, which professed to sever the matrimonial tie. In order to procure an act of this nature, it was necessary, first, that a separation *a mensâ et thoro* should have been procured in the ecclesiastical courts, and that the aggrieved party should have recovered damages in an action against the adulterer. We have seen that a separation *a mensâ et thoro* was permitted by the canon law. The law of England, after the reformation, adopted this practice. The grounds on which a separation might be obtained were adultery and cruelty, but not simple desertion. The separation thus effected lasted only during the pleasure of the parties; but while it subsisted, the wife, if the injured party, could compel the husband to grant her an aliment.

In Scotland, divorce may be obtained on the ground of adultery or wilful desertion. Immediately after the reformation, the courts in Scotland recognised the right of either spouse to obtain a divorce on the ground of adultery. And in the year 1573, a statute was passed declaring that, in case either husband or wife should desert without due cause for four years, the injured party might raise an action of adherence, and, in case redress was not obtained, a decree of divorce might be pronounced. In Scotland, it is not permitted that a marriage should take place between the offending parties. The effect of a decree of divorce on the pecuniary interests of the parties, is to cause the offender to forfeit all benefit which might accrue to him or her from the marriage. Separation *a mensâ et thoro* may also be obtained in Scotland on the ground of ill-usage, and perhaps desertion (q. v.). Condonation and collusion, but not recrimination, are, in Scotland, a bar to obtaining a dissolution of marriage on the ground of adultery.

**DIVORCE AND MATRIMO'NIAL COURT.** The late statutes, 20 and 21 Vic. c. 85, 21 and 22 Vic. c. 108, 23 and 24 Vic. 144, have effected an entire change in the law of England on the subject of divorce. By the first of these acts, the jurisdiction in divorce causes is transferred from the ecclesiastical courts to a new court constituted for the purpose. The court is composed of a judge ordinary, the three chiefs in the courts of common law, and three puisné judges. It is provided that either spouse may obtain a divorce on the ground of adultery, but in case the wife is petitioner, the adultery must be accompanied by cruelty or desertion. By 23 and 24 Vic. c. 144, the power to pronounce a decree of divorce, which was at first reposed in the whole court, is given to the judge ordinary sitting alone; but in this case the decree so pronounced is a decree *nisi*, and cannot become final for at least three months. After decree of divorce, the offending party is free to marry again even with the paramour. But it is enacted, 20 and 21 Vic. c. 85, sec. 57—58, that no clergyman shall be compelled to solemnise the marriage of any person who has been divorced. He must, however, allow another clergyman, if willing to do so, to perform the marriage. A party applying for a divorce will not be allowed to obtain judgment, should it appear that he or she has been guilty of recrimination by committing the same offence, or that there is collusion between the parties in order to procure the divorce. Parties also who have condoned the offence—that is, who after it has been discovered have consented again to live as husband and wife—will not be allowed to obtain a divorce. In order to guard against fraud by parties conniving to procure a divorce, power is given to the Queen's proctor, by 23 and 24 Vic. c. 144, to interpose, in case he have reasonable ground to suspect collusion or recrimination, in order to oppose a petition for divorce. By these acts, parties are also entitled to obtain a judicial separation on the ground of adultery, cruelty, or desertion. Judicial separation is declared to be in place of a separation *a mensâ et thoro*. A married woman, having obtained decree of judicial separation, is declared to be in all respects as a *feme sole* in regard to any property that she has or may acquire. Even before obtaining a separation, a woman deserted by her husband may obtain from the court a protection for any property which she may acquire by her own industry.

From the conflict of laws in various countries on the subject of divorce, questions have frequently arisen as to the competency of a sentence of divorce by a tribunal having power according to the *lex loci* to pronounce such sentence, to annul a marriage contracted in a country where such divorce is not allowed. It appears now to be the generally received opinion, that wherever parties are domiciled they will be allowed to avail themselves of the laws of this domicile. But the courts will not recognise a transient visit to a foreign country as sufficient ground to sustain a divorce. On the subject of this article, see Shelford *On Marriage and Divorce*, Fraser's *Personal and Domestic Relations*, and Swabey *On the Divorce and Matrimonial Act*.

**DI'XON**, William Hepworth, an English author, was born in the West Riding of Yorkshire in 1821, and settled in London in 1846, where he soon acquired a considerable reputation by his writings. A series of papers, published in the *Daily News*, 'On the Literature of the Lower Orders,' and another on 'London Prisons,' attracted considerable attention. The latter reappeared in a volume published in 1850. Before this, but in the same year, he published *John Howard, and the Prison World of Europe*. It was with difficulty he could induce a publisher to accept it, yet when published, it went through three editions in one year. D. now devoted himself principally to historical biography. In 1851, appeared the first edition of his *William Penn*, a work called into existence by the onslaught made by Macaulay on the eminent Quaker, in which D. undertook to disprove Macaulay's charges. In 1852 was published his *Life of Blake;* and in the same year an anonymous pamphlet, entitled *The French in England*, the design of which was to allay the fear of a French invasion which at that time was pretty general. In 1853, D. was appointed editor of the *Athenæum;* and in 1860 he published his *Life of Lord Bacon*, an effort to vindicate that great philosopher from those charges of corruption and baseness which Macaulay and others had brought against him. D. in all his works exhibits a graphic literary power, united with patient and persevering industry.

**DI'XON'S E'NTRANCE**, a strait of 100 miles in length from east to west, on the north-west coast of America, divides Queen Charlotte Island on the south from the Prince of Wales Archipelago on the north. It is, therefore, of some political importance, as separating the British possessions in this quarter from those of Russia. Lat. 54° 30′ N., and long. 132° W.

**DIZFU'L**, a town of Persia, on the river Dizful, in lat. 32° 10′ N., and long. 48° 34′ E. It is the capital and principal mart of its province (Khuzistan). A handsome bridge of twenty arches crosses the river here. The foundation is of stone and of ancient date, the upper portions are of brick and are modern. Pop. estimated at 15,000.

**DIZIER**, St, a town of France, in the department of Haute-Marne, 10 miles north of Vassy, is situated on the Marne, which here begins to be navigable. It is a very long and narrow, but well-built town, the streets being wide, clean, and regular. In 1544, D. resisted for a month the assaults of a Spanish army under Ferdinand de Gonzaga; a resistance of the greatest consequence to the French ruler, Francis I., the delay enabling him to collect his forces to oppose the march of the Spaniards upon Paris. In 1814, the French twice defeated here the invading army of the allies. The chief industrial features of the place are iron forges and foundries, boat-building yards, in which a great number of river and canal boats, generally of about 100 tons, are constructed, and cotton factories. There is also a considerable trade in wood, iron, and grain. Pop. 6508.

**DJE'ZZAR**, i. e., *Butcher*, the name given, on account of his cruelty, to Achmed Pasha, famous for his obstinate defence of Acre against Napoleon I. He was born in Bosnia about 1735, and rose, through murder and treason, from the condition of a slave to the pashalic of Acre. In the beginning of 1799, the French entered Syria from Egypt, and advanced from victory to victory till they reached Acre, which was laid siege to on the 20th March. By the advice of Colonel Philippeaux, a French emigré, and of Sir Sydney Smith, the commander of the British fleet in the Levant, D. was induced to hold out; and such was the savage doggedness of his resolution, that Bonaparte was obliged to retire on the 21st of May. It is said that during the siege he sat on the floor of his palace surrounded by a heap of gory skulls, distributing money to all who brought in the heads of Frenchmen. He died at Acre in 1804. D. was at times maniacal in his cruelties. He whipped off the heads of his wives without the slightest ceremony—seven at a time! But he had also moments of remorseful tenderness, in which he helped the poor and provided for those he had injured. He is said to have possessed the sharpest discernment, and was a very vigorous ruler.

**DMITRO'V**, an ancient town of Russia, on the Jakhrama, an affluent to the Volga, 40 miles north of Moscow. It covers a large area, a considerable part of which is occupied by gardens, but as a whole is poorly built. It contains a college and seven churches, and has manufactures of silk and cotton goods, tanneries, &c. Pop. 5000.

**DNIE'PER**, one of the large rivers of Europe, has its source in certain swampy forest-lands in the north of the Russian government of Smolensk. Its general direction, till it reaches Kiev, is south. From Kiev, its course is south-east to Ekaterinoslav, where it turns directly south past Alexandrovsk, below which town it sweeps round to the south-west, and pursues that direction until it debouches in the Black Sea, between the governments of Kherson and Taurida, its embouchure forming a gulf of about 50 miles in length, with a breadth of from 1 to 6 miles. Its principal affluents are the Desna and Soj from the east, and the Pripet, the Beresina, and the Druz from the west. The total length of the D. is upwards of 1000 miles, and it is navigable almost from its source, its breadth at Dorogobush, about 50 miles below its source, being 210 feet. Some of the finest governments of the Russian empire lie within its basin, with all of which its navigable branches and canals enable it to hold communication. In its upper part, it flows through a marshy forest territory; its middle and lower course is rocky. Below Ekaterinoslav, indeed, there are no less that 13 rapids in the course of about 40 miles; but these impediments to navigation have been overcome in part by blasting, and by splendid hydraulic-works erected by the Russian government. The produce of the provinces, consisting for the most part of corn, timber, iron, salt, hemp, and linen, are usually conveyed down the river to ports on the Black Sea, but many vessels pass annually from the D. to the Baltic by the Beresina and the Dwina. At Smolensk, the waters of the D. are frozen from November to April; at Kiev, they are ice-bound only from January to March. Sturgeon, carp, and pike abound in the river. As the *Borysthenes* the river was known in the 7th c. before Christ to the Greeks, who regarded it as the most valuable river on earth next to the Nile.

**DNIE'STER**, a river of Europe, flowing chiefly through Russia, but having its rise in the Carpathian Mountains, in the Austrian crown-land of Galicia, about lat. 49° 10′ N., long. 23° E. Its general course, until it reaches the Russian territory, is south-east; it then runs east for a short distance, and thence south-south-east, forming the boundary between Bessarabia and Kherson, past Mohilev, Dubossari, and Bender, to the Black Sea, which it enters by a shallow shore lake, 19 miles in length and 5 in breadth, between Akerman and Ovidiopol. The total length of the D. is between 500 and 600 miles, its current throughout being very rapid. Until it reaches the Russian frontier, its right bank is skirted by offsets from the Carpathians; but at that point, the country, which above has been level on only one side, opens into a broad flat plain, through which the river, broken at intervals by masses of rock, rushes muddy and turbid. The downward navigation is interrupted by a series of falls and whirlpools. Wood and grain are the chief products conveyed down the river.

**DÖA'B**, a word of Sanscrit origin, signifying primarily 'two rivers,' but applied, like the Gr. *Mesopotamia*, and the Lat. *Interamna*, to the country between two rivers. The two roots of the word are common to all the Aryan languages: the first appears in Lat. *duo*, Eng. *two;* the second in Celt. *avon*, a river, and in Dan*ube* or Don*au*. Punjab ('five rivers') is a term of the same kind; but while Punjab exists merely as a proper name of one particular region, Döab is used as the common appellation of any region in general that fulfils the conditions. When introduced, however, without local reference of any kind, the Döab means the space enclosed by the Jumna on the south-west and the Ganges on the north-east—a space extending from Allahabad to the base of the Himalayas, a distance of upwards of 500, with an average breadth of 55 miles. The fertility of this region has been much increased by the Ganges Canal (q. v.).

**DO'BCHICK.** See Grebe.

**DOBELL**, Sydney, a living English poet, was born in London in 1824. His father, who was a wine-merchant, removed to Cheltenham in 1835. Here D., whose education was entirely private, lived till 1850, when the *Roman* was published, and received with favour by the literary world. After the publication of this poem, D. resided for some time in Switzerland. Shortly after his return, the delicate state of his wife's health brought him to Edinburgh, where he remained till 1857. He has subsequently lived chiefly at Cheltenham and the Isle of Wight. Besides the *Roman*, D. has published *Balder* (1854), *Sonnets on the War*, in conjunction with Mr A. Smith (1855), and *England in Time of War* (1856). His poems exhibit a singular mixture of the philosophical and the poetical spirit. Many of his passages are as spiritual in conception and lavish in imagery as the finest portions of Shelley; others, again, are as obscure, intricate, and involved as the rhymed enigmas of Cowley or Donne. *England in Time of War* is, on the whole, his best book, and contains many passages full of pathos and natural feeling, and sometimes even an entire poem of almost faultless perfection, such as *Keith of Ravelston.*

**DÖ'BELN**, a town of Saxony, 36 miles south-east of Leipzic, is pleasantly situated on an island formed by the Mulde. It is well built, and contains a richly endowed hospital. Its chief manufactures are linen, woollen, and cotton cloth, brass-ware, and hats. D. has also several bleach-fields and worsted-mills. Pop. 6000.

**DOBROW'SKI**, Joseph, the founder of Slavic philology, was born August 17, 1753, at Gyermet, near Raab in Hungary, where his father, a Bohemian by birth, was stationed in garrison. He studied at the gymnasium of Deutschbrot, and subsequently at Klattau and Prague. In 1772 he entered the order of the Jesuits at Brünn, but on its dissolution ten months after, he returned to Prague, to continue his theological studies, and in 1776 became tutor in the family of the Count von Nostitz. During the years 1780—1787, he edited a critical journal of Bohemian and Moravian literature. This soon involved him in various strifes, and ultimately the review was 'stopped' by the authorities, but not before it had added largely to D.'s reputation. In 1792, at the expense of the Royal Bohemian Scientific Society, he made a journey to Denmark, Sweden, and Russia, to search after the fate of those Bohemian books and MSS. which the Swedes had carried off from Prague during the Thirty Years' War. Two years after, he travelled through Germany, Italy, and Switzerland. On his return, he manifested symptoms of a disordered mind, and in 1801 had to be confined for some time. He speedily recovered, but was subject to intermittent fits of insanity until his death, which happened January 6, 1829. D. is reckoned one of the highest, if not the very highest, authority on all matters connected with Bohemian history and literature. His principal productions are—*Scriptores rerum Bohemicarum* (Prag. 2 vols., 1783—1784); *Geschichte der Böhm., Sprache und ältern Literatur* (Prag. 1792); *Die Bildsamkeit der Slaw. Sprache* (Prag. 1799); *Deutsch-Böhm., Wörterbuch* (2 vols., Prag. 1802—1821), in which he was largely assisted by other eminent Bohemian scholars; *Lehrgebäude der Böhm.-Sprache* (Prag. 1809); and *Institutiones Linguæ Slavonicæ Dialecti Veteris* (Vienna, 1822), probably his most important work. D. wrote only in German or Latin, being of opinion that the Bohemian language was not a suitable vehicle for the expression of learned inquiry.

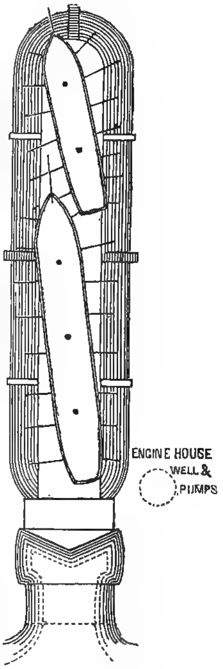
**DOBRU'DSCHA** (anciently, *Scythia Minor*), a name used to denote the north-eastern portion of Bulgaria (q. v.). It is separated by the Danube from Wallachia on the west, and from Moldavia on the north; is bounded on the east by the Black Sea, into which its northern extremity stretches; while towards the south its limits are not clearly defined. The D. has long been a famous battle-ground. Some of the earliest incidents of the Russian war of 1854—1856 took place here.

**DOCE'TÆ** (from the Gr. *dokeō*, to appear or seem) was the name given in the early church to those heretics who held that the human nature of Jesus Christ was a semblance and not a reality. The philosophers of polytheism, as well as of Judaism, had explained the appearances of divinities and of angels by holding that the assumption of bodies was only momentary, or in appearance. And when the Gnostic Christians found it impossible to conceive the essential union of the divine nature with a body composed of matter, which they held to be the seat of all evil, they had recourse to the same expedient. The difficulty was got over in one of three ways: the body of Christ was either considered a real earthly body, but not belonging essentially to his nature, and only assumed for a time; or it was declared to be a mere appearance or illusion; or, finally, it was believed to be a heavenly body, composed of ethereal substance, though having the appearance of being material. All the Gnostic heretics held Docetism in one or other of these three forms, with the exception of those who were led by the same difficulty to deny the divine nature of Jesus Christ, and reduce him to a mere human sage. While the first of these alternative forms of heresy seems to have completely died out, the last, under various names, has continued to the present time. For a clear and learned account of Docetism, consult Neander's *Dogmengeschichte* (History of Doctrine). English by J. E. Ryland; published by H. G. Bohn, in 2 vols., 1858.

**DOCK** (*Lapathum*), a sub-genus of the genus *Rumex*, the other species of which are generally called Sorrel (q. v.), containing those which are not acid, and of which the flowers are hermaphrodite. They are large perennial herbaceous plants, natives chiefly of temperate climates, with large generally lanceolate or ovate leaves, and panicles of small greenish flowers. They have great tap-roots, and are with difficulty eradicated from pastures. They also multiply rapidly by seed. The best mode of dealing with them, is generally found to be repeated cutting away of their leaves and shoots, by which the plants are killed. Many of the species prefer watery places. A number are natives of Britain, and several of the European ones have found their way to North America, where they have become troublesome weeds, a number of really indigenous species being also found there. Useless and even troublesome as the D. is generally esteemed, yet the large astringent roots are capable of being beneficially employed in medicine; and those of the great Water D. (*R. hydrolapathum*) in particular—for which the Druids entertained a superstitious veneration—are administered as an antiscorbutic. They are also employed in rheumatism, and sometimes as a styptic, sometimes to form an astringent gargle, and sometimes as a dentifrice. *R. alpinus* is called Monk's Rhubarb, and its root was formerly employed instead of rhubarb, but is less powerful. It is a native of the Alps, and has been found in several places in Britain.—The roots of docks have been sometimes used in dyeing, and give 'a great variety of shades, from straw-colour to a pretty fine olive, and a fine deep-green to cloths which have been previously blued.'

**DOCK**, an enclosure for the accommodation of shipping, and of which there are three kinds—viz., wet or floating; tidal, which may with more propriety be called harbours or basins; and dry or graving. Wet Docks are for the purpose of maintaining a level nearly uniform with that of high-water, so as to keep vessels always afloat, and to save them from rubbing up and down the quays with the rise and fall of the tide, and being sometimes too high and at other times too low for convenience in shipping or discharging cargoes.

Wet docks are generally surrounded by quay or wharf walls of masonry or brickwork, but where they are wanted chiefly for laying up vessels in, and not for loading or unloading, their margin is sometimes only a natural sloping beach. They are of most importance in places where there is a great rise and fall of tide, such as at Bristol or Liverpool, where they are almost indispensable; while, again, in the Clyde, where the tides are small, they have not yet been used, though they have been projected at Glasgow for many years past. Wet docks are generally entered by means of what is called a lock (see Lock), having two gates, in one leaf, or more frequently in two folding-leaves each, which enables vessels to enter or depart for a considerable time before and after high-water; but frequently, for the sake of economy both in space and in cost, they have only one gate, so that vessels can only enter or depart at or very near high-water, unless the water in the dock be run down considerably below that level.



Plan of Dry Dock.

The water in wet docks is sometimes kept, by means of pumping, permanently at as high a level as that of the highest tides, when a supply of pure water can be procured, to prevent the silting caused by the admission of any considerable body of turbid water by the gates, but that involves the necessity of locking up or down always except at the highest tides. The tendency to silt up by deposits of fine mud is of common occurrence, and dredging, or some other plan, must be resorted to for the purpose of keeping the dock reasonably clear. In almost all cases, wet docks require to be occasionally emptied for the purpose of cleaning.

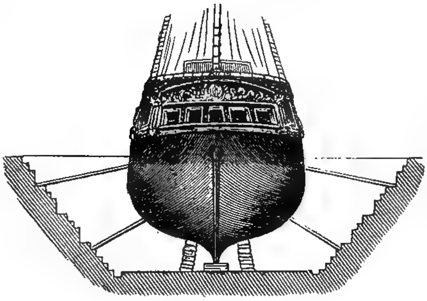
Dock-gates are generally opened and shut by means of chains worked by hand, either by winches or capstans; but of late years they have in some cases been moved by hydraulic machinery, as at Great Grimsby and at the Victoria Docks in the Thames below Blackwall.

Tidal docks require no particular description; they are merely basins surrounded by quay walls, and having open entrances permitting the free flow and ebb of the tide, as at Greenock and Troon, and they have the advantage of requiring no opening or shutting of gates. With small tides, they answer very well, and they are sometimes made deep enough to keep vessels afloat at low-water; but with tides of considerable range they are attended with the disadvantage of large vessels grounding at low-water, and from the large volume of water, generally more or less turbid, which enters at every tide, they are much more liable to silt up than wet docks are. For ridding them of muddy deposits, the plan is sometimes resorted to of letting out a reserve of water with a sudden gush from an enclosure at the inner end, at the time the tide has receded. This is called scouring. Such is the process pursued at Boulogne.

The quays of wet and of tidal docks must have mooring-ports or rings for making vessels fast to

They are generally provided with sheds to keep goods dry, with cranes for shipping or unloading heavy articles, and with staiths or drops in the case of coal-shipping ports, and now they very frequently have rails laid along them.

Dry docks are used for the purpose of laying vessels dry for examination or repairs. They may have their entrance either from a wet dock or from a tidal harbour; but the former is by much the better arrangement, as it admits of vessels being docked or taken out at any time of tide, and it keeps a more equal pressure on the gates, thereby making them less liable to leak. They require to be built of good water-tight masonry. The entrance has generally a pair of folding-gates pointing outwards, to exclude the water; but sometimes it is closed by means of a caisson—viz., a vessel shaped something like the hull of a small ship, and having a keel and two stems, which fit into a groove in the masonry. The caisson is sunk into the groove by admitting water into its interior, and is floated out again by pumping out the water. When the tides are very large, the bottom of the dock may sometimes be placed above low-water, so that it may be run dry without pumping; but generally the bottom of a dry dock for the reception of any but very small vessels is below that level, in which case a steam-engine and pumps, with a well and water-channels leading to it, are required for emptying the dock.



Section of Dry Dock.

The floor is nearly level, and the keel of the vessel to be docked rests on wooden blocks fastened down to prevent them floating, and of such a height as to admit of the shipwrights getting under the vessel's bottom. Side-shores are put in, to keep the vessel in an upright position, and blocks are fitted in under the bilges as soon as possible after the water has been got out of the dock. The sides generally consist of stone steps called altars, for the purpose of fixing the lower ends of the shores, and also for the convenience of supporting the workmen's scaffolds. Dry docks are frequently made long enough to hold three or four vessels of considerable size at one time, in which case they are placed, not in the centre line of the dock, but obliquely across, so as to give more available length.

The use of the graving dock is frequently superseded by that of Morton's patent-slip, or marine-railway, forming an inclined plane, by means of which the vessel is hauled on a cradle or carriage on wheels, quite out of the water. See Slip.

The following is a nearly correct statement of the number and areas of the mercantile wet docks, including those entrance basins which are provided with gates, at a number of the principal ports of Great Britain.

| | No. | Area in Acres. |
|---|---|---|
| London, . . . . . | 28 | 350 |
| Liverpool, . . . . . | 38 | 206 |
| Birkenhead, belonging to the Liverpool Corporation, . . . . | 4 | 142 |
| Bristol, . . . . . | 4 | 79 |
| Hull, exclusive of timber-ponds, . | 7 | 46¾ |
| Great Grimsby, . . . . | 2 | 51 |
| Hartlepool, . . . . . . | 1 | 20 |
| West Hartlepool, exclusive of timber-ponds, | 3 | 32 |
| River Wear, . . . . . | 2 | 41 |
| River Tyne, . . . . . | 4 | 107 |
| Leith, . . . . . . | 3 | 15½ |
| Dundee, partly unformed, . . . | 4 | 34 |
| Aberdeen, . . . . . . | 1 | 35 |

Liverpool has 14 graving docks, many of them being 600 feet in length.

No docks in the world are on so splendid a scale as those of London, Liverpool, and Birkenhead, which, as seen from the foregoing list, are of immense area, in order to accommodate different classes of foreign and native shipping. Surrounded with substantial stone quays, provided with gates, placed under a proper police, and otherwise managed in a costly manner, these as well as nearly all other docks in Great Britain require to be supported by rates levied from the vessels resorting to them; and for levying these rates, powers are taken in the acts of parliament authorising the construction of the respective docks. Sometimes the dock dues or rates are imposed on vessels in bulk according to tonnage, and in other instances, the rates are so much per ton, according to the nature or value of the goods. See M'Culloch's *Commercial Dictionary*. Generally, the dues are complained of as being a heavy burden on commerce; but so enormous is the cost of constructing docks, that the joint-stock companies by which they are for the most part owned, do not often realise good returns for their investments. In some cases, as in that of Leith, the financial affairs of wet docks would have subsided into utter insolvency, but for the interposition of loans from the public treasury. The most remarkable circumstance connected with English docks, is the rapid extension of the dock-system on the Mersey at Liverpool, where from £65,782, in 1810, the dock and harbour dues had increased to £667,567 in 1861—the increase in the last year alone being £63,297.

**DOCK WA'RRANTS** are orders or authorities for the removal of goods and merchandise warehoused in the various docks. The orders are granted by the proper officer at the docks, on application of the importer, in favour of any one whom the latter shall name. Careful rules as to obtaining warrants are laid down by the East and West India Dock and the London Dock Companies. These rules are, in a great measure, followed by the other dock companies in the kingdom. Unless the rules are complied with, goods will not be delivered from the docks. Warrants may be obtained for either the whole or a part of a cargo consigned. A warrant may be assigned by the holder. A single warrant may also, at the desire of the holder, be divided into smaller warrants, and these also may be assigned. In case a warrant is lost, a new warrant will not be issued till the loss has been advertised, and the holder furnish the company with an engagement to indemnify them for any loss which may arise.

**DO'CK-YARD BATTA'LIONS** form a special element in the British military service, intended chiefly for the defence of the royal dock-yards. It was in 1847 that an item first appeared in the estimates of £20,000 for training and exercising about 9000 men in these battalions. Clerks, artisans, and labourers form the body. The colonel is a naval officer, and commissions are given to the other officers. The men receive remuneration for the time lost in drilling. A few hours per week in summer are set apart for drilling, under the management of sergeants and corporals of marines. At first, the enlistment was voluntary; now, however, it is compulsory; but as it is generally popular, there is no difficulty in keeping the list filled.

**DOCK-YARDS**, Royal. Under the names of the several towns where the royal dock-yards are situated, will be found brief notices of those establishments. Under the present heading, a few remarks may be useful concerning the whole of them collectively.

Most of the royal ships are built by the government, at one or other of the dock-yards at Portsmouth, Plymouth, Sheerness, Chatham, Woolwich, Deptford, or Pembroke. Each of these establishments comprises slips on which the ships are built, sheds under which they are finished, docks in which they are kept, and all the appliances for rigging them out for sea. Boat-building and mast-making are also carried on; and in some, though not all of the yards, rope-making, sail-making, anchor-forging, block-making, and other manufacturing operations connected with the finishing and furnishing of ships. There are also arrangements connected with the storing of guns and other munitions of war. Some of the yards, especially those at Plymouth, Portsmouth, and Deptford, comprise large establishments for victualling the navy; some for supplying seamen's clothing and necessaries; some for repairing steam-machinery for war-steamers; one (at Chatham) for making most of the articles in copper and brass required by the navy. Since the creation of a steam-navy, and the large substitution of iron for wood in ship-building, an increasing proportion of the royal ships are built in private yards. All the dock-yards are under the Admiralty, and each is governed by a distinct set of officers responsible only to that department. The chief officer, called the superintendent, is generally an admiral, but sometimes only a captain; and the office is deemed an honourable recognition of past services. The superintendent controls all the other officers, and all the artificers and labourers employed; examines the accounts, authorises the payments, and is responsible for the stores. When a new ship is to be built, or other work executed, the superintendent receives general instructions from the Admiralty, while special instructions are conveyed to other officers more immediately concerned with the actual working. In those yards where steam-machinery is repaired and fitted, engineers form an important part of the establishment. The artisans of the dock-yards comprise shipwrights, calkers, joiners, sawyers, smiths, millwrights, blockmakers, riggers, sailmakers, rope-makers, &c.; while under these is a large body of labourers.

Without entering into detailed items, mention may be made of the following provision for the dock-yards, for the year 1860—1861. About £130,000 for salaries to superintendents, clerks, &c. Wages to about 20,000 artificers and labourers, nearly £1,400,000. These sums relate to personal services only in the dock-yards. The materials for ship-building and steam-machinery were set down at £3,000,000; while another large sum was appropriated to enlargements of the several dock-yards.

The management of the royal dock-yards is considered to be very defective. Several committees and commissions have been appointed, in recent years, to investigate the causes of the defects, and to suggest remedies; and the reports issued on the subject are engaging the attention of the government and the legislature.

**DO'CTOR** (Lat. *docēre*, to teach), a teacher. Originally, the word doctor was used, in accordance with its etymological derivation, to signify a teacher in general, and it was not till the 12th c. that it became a title of honour for the learned, irrespective of the function of communicating knowledge. It had frequently appended to it, in those early days, some additional expression intended to characterise the peculiar gift of its possessor. Thus, Thomas Aquinas was called the Doctor Angelicus; Bonaventura, the Doctor Seraphicus; Alexander de Hales, the Doctor Irrefragabilis; Duns Scotus, the Doctor Subtilis; Roger Bacon, the Doctor Mirabilis; William Occam, the Doctor Singularis; Gregory of Rimini, the Doctor Authenticus; Joseph Gerson, the Doctor Christianissimus; Thomas Bradwardine, the Doctor Profundus; and the like. The word had long been used, even in the universities, as a general expression for a teacher before it came to designate a degree or rank in the learned hierarchy to which only the united body of the teachers could advance or promote the candidate. These formal promotions commenced at Bologna in the 12th c., and the learned Irnerius, the regenerator of the Roman law at that period, is said to have introduced the ceremonial which was afterwards universally adopted. Irnerius, however, is a sort of mythical hero in university history, and such statements with regard to him must be received with caution. See Promotion. The university of Paris almost immediately followed in the footsteps of Bologna, the first reception of doctors having taken place in the year 1145, in favour of Peter Lombard and Gilbert de la Porrée, the greatest theologians of the day. Subsequently to this period, the emperors were in use expressly to confer upon the universities the right of appointing doctors of laws by their authority and in their name. The example of the emperors was speedily followed by the popes, who conferred corresponding rights with reference to the canon law. From the 11th to the 13th c., there seems reason to believe that, both in Italy and France, the terms master and doctor were pretty nearly synonymous. In the German universities, the professors of theology were more commonly known as masters; and in the beginning of the 15th c., in accordance with the practice of the university of Prague, the distinction was pretty consistently made between doctors of law and medicine, and masters of theology and philosophy. In modern times, the title of Doctor has been applied almost everywhere to the three faculties of Theology, Law, and Medicine. In Germany, it extends to that of philosophy, in which, in this country, the older title of Master is still retained. The doctor's degree is, in general, conferred at the instance of the dean of the faculty to which it appertains. It is granted either on examination, and after the ancient form, at least, of publicly defending a learned thesis in Latin has been observed, or else it is an honorary degree, conferred in consideration of the general reputation of the recipient for eminence in some particular branch of learning, philosophy, or science. See Degree. In Germany, the doctor ranks before the untitled nobility and next to the knight; and amongst themselves, doctors take the rank of the faculties to which they respectively belong, the first being theology, the second law, and the third medicine. In Oxford and Cambridge, and recently also in the German universities, doctors of music have been created. In the latter country, also, learned ladies have occasionally shared the honours of the doctorate. Dorothea Schlözer received the degree of doctor of philosophy from the university of Göttingen in 1787; Mariane Charlotte von Siebold, that of medicine from Giessen in 1817; and Johanna Wittenbach, in philosophy, from Marburg in 1827. Of the four ancient degrees of Bachelor (q. v.), Master of Arts (q. v.), Licentiate (q. v.), and Doctor, the modern university of France has retained only those of bachelor, licentiate, and doctor. Up to the period of the revolution, the highest consideration attached to the title of Doctor of the Sorbonne (q. v.)—that famous theological faculty, which was called 'the perpetual council of the Gallican church,' and of which the present faculty of theology of the Academy of Paris is but a feeble and lifeless reproduction. But though the degrees of the Sorbonne continued to enjoy, and apparently to merit, some degree of respect, such was by no means the case with those of the other schools of learning in France. Furettière, in his Dictionary, defines a bachelor as a man who learns, and a doctor as a man who forgets. The ridicule of Voltaire, La Fontaine, Le Sage with his Doctor Sangrado, and Molière in the *Malade Imaginaire*, will readily occur to our readers as illustrating the position which was then held very generally by French doctors.

In England, the doctor's degree was not introduced into the universities till the reign of John or of Henry III. At first it was a very rare and highly prized honour, and the ceremony of conferring it was attended by scenes of feasting and revelry, of which curious accounts will be found in Antony à Wood's *History and Antiquities of the University of Oxford.* Coloured engravings of the dresses worn by doctors of the several faculties at Oxford and Cambridge are given in Ackermann's Histories of these Universities. As to professional uses of the degree of Doctor of Civil Law, see Doctors Commons.

**DOCTORS COMMONS**, formerly the college of the doctors of civil law in London, wherein the Court of Admiralty and the principal ecclesiastical courts were held. It was founded by Dr Henry Harvey, Dean of the Arches, previous to which time the doctors had lived in Paternoster Row. The original building was burned in the great fire in 1666, when the doctors removed for a time to Exeter House. After some time the Commons was rebuilt, and the doctors returned to their former quarters. The courts which have been wont to hold their sittings at Doctors Commons are—the Court of Arches, the Archdeacon's Court, the Prerogative Court, the Faculty Court, the Court of Delegates, and the Court of Admiralty. The Prerogative Court is now amalgamated in the Probate Court (q. v.), and the Court of Delegates (q. v.) is transferred to the Judicial Committee of the Privy Council. At the time when these courts were all in full operation, their times of session were regulated by terms, as in the courts of equity and common law, a certain day in the week being assigned to each court for hearing its causes. The Court of Arches, the Archdeacon's Court, the Faculty Court, and the Court of Admiralty, are now the only courts which continue to exercise their functions in this once famous spot. The Court of Arches (so called from having sat in *Arcubus*, or under the arches or bows of Bow Church, Cheapside) is the court of appeal belonging to the Archbishop of Canterbury. The judge in this court is styled Dean of the Arches, and he has jurisdiction, as the archbishop's principal official, in all ecclesiastical causes within the province of Canterbury. He has original jurisdiction, also, in certain causes by *Letters of Request* (q. v.). It was by virtue of letters of request that matrimonial causes were tried in the Court of Arches; but this branch of its jurisdiction is now removed to the Divorce Court (q. v.). The Archdeacon's Court is an inferior court for the consideration of ecclesiastical questions occurring within the archdeaconry. For an account of the other courts mentioned in this article, see the several heads to which they refer. The practitioners in the several courts to which we have alluded were the doctors of civil law, called in the ecclesiastical courts advocates and proctors, who performed similar duties to those of attorneys or solicitors in the courts of law and equity. Both classes of practitioners required, in order to their admission to practice, to obtain the fiat of the Archbishop, and afterwards to be duly admitted by the Dean of the Arches. The form of admission was in both cases attended with much ceremony. The doctor elect was introduced to the presiding judge by two doctors habited in their scarlet robes. The candidate then made a short Latin speech, and was admitted to practise in the courts. The habit of the doctors is a scarlet robe with a hood, which, in case the doctor be a graduate of Oxford, is bound round with taffeta. If he belongs to the University of Cambridge, it is trimmed with white minever. The proctors were, in like manner, introduced by two senior proctors. Their dress is a black robe with a hood lined with fur. A proctor could not take a clerk till he had been a numerary for five years, and he was not entitled to take a second till the first had performed five years of service. The number of doctors and proctors has varied much at different periods. In the year 1694, the number of the former was limited to forty-four, and of the latter to forty-three. For a full account of Doctors Commons, see Stowe's *London.*

**DOCTRINAIRE** (a French term derived from doctrine) signifies, properly, the scientific taking up and exposition of a subject, as opposed to a treatment which is merely external, and which rests on accidental characteristics. In general, however, it is used as a term of reproach, to characterise views which are pedantic, schoolmasterly, and unpractical. In this sense it was applied in France, during the Restoration, by the reactionary court-party to the fraction of the parliamentary opposition, who supported scientific doctrines of constitutional liberty against the arbitrary will of the monarch. This party, which had its rallying-point in the salons of the Duc de Broglie, was led in the chamber by Royer Collard, and supported in the press and before the public by Guizot, and the younger members of what afterwards became the Orleans party. The development of the constitution on the basis of the *charte* of Louis XVIII., was the watchword of those men; but their real inspiration was derived from England. When the revolution of 1830 occurred, they became the advisers and ministers of the king of the French, and were more deeply imbued with the principles of constitutional monarchy than any other political party that has ever existed in France. The true fathers of the *doctrinaires* were Mounier, Lally Tollendal, Clermont Tonnerre, Talleyrand, and the Abbé Montesquiou; and the cradle of the party was the original *comité* of the constitution, which, about twenty-five years before, elaborated the *charte* of 1814. Its present representatives still find a centre in the court of the exiled Queen Marie Amalie at Claremont, and a vigorous supporter in her gifted son, the Duc d'Aumale.

**DO'CTRINE.** See Dogma.

**DODD, The Rev. William, LL.D.**, was born in 1729 at Bourne, in Lincolnshire; was educated, in the first place, at a private school; and was admitted, in 1745, as a sizar to Clare College, Cambridge, where, after five years of study, he took his degree of B.A. Shortly after, he removed to London, received orders from the bishop of that city, and soon afterwards gained a reputation as a popular preacher and as a successful littérateur. Through his celebrity as a divine and man of letters, and by means of flattering the great, he succeeded well in London, and in 1763 was appointed tutor to Philip Stanhope, the fifth Earl of Chesterfield. His habits, however, were very expensive, and an income of £800 per annum, even when augmented by the produce of his literary labours, was not sufficient to supply his wants. This extravagance proved his ruin, as it tempted him to forge the signature of his former pupil, the Earl of Chesterfield, to a bond for £4200. For this crime he was arrested in February 1777, and though he refunded the money, he was tried, convicted, and executed on the 27th of July. His writings are numerous and varied. His *Beauties of Shakespeare* (2 vols., Lond. 1753) is well known, as are also his *Reflections on Death* (1763), and *Thoughts on Death*, a poem composed during the time that intervened between his conviction and execution.

**DO'DDER** (*Cuscuta*), a genus of plants referred by some botanists to the natural order *Convolvulaceæ*, and regarded by others as the type of a small distinct natural order, *Cuscutaceæ;* which differs from *Convolvulaceæ* in the habit of the plants, leafless climbing parasites, with flowers in dense clusters; in having scales on the tube of the corolla alternate with its segments; and in having a spiral thread-like embryo, lying in a mass of fleshy albumen, whilst the cotyledons are so small that the embryo has been described as destitute of them. There are about fifty known species of *Cuscutaceæ*, chiefly found in the warmer temperate parts of the globe. The name D. is often extended to all of them. One or two species of *Cuscuta* are natives of Britain, parasitic on leguminous plants, heath, thyme, hops, nettles, &c. A species of D. is very injurious to crops of flax in Germany, and leguminous crops often suffer from this cause in the south of Europe. The seed of D. germinates in the ground, but the stem soon seeks to attach itself to plants by little rootlets which it sends out, and the original root dies. The appearance of D. has been described as resembling 'fine, closely tangled, wet catgut.'

Dodder (*Cuscutaceæ*).

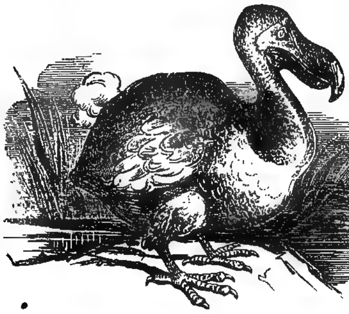
**DO'DDRIDGE, PHILIP**, D.D., an eminent dissenting preacher and author, was born in London in the year 1702, and educated for the ministry at a theological academy at Kibworth, in Leicestershire, presided over by a Mr John Jennings. In 1722, he became pastor of the dissenting congregation at Kibworth, and in 1729 received a call to Northampton, where he also became president of the theological academy now removed from Kibworth to that town. Here he continued to preach and train young students for the ministry till within a short period of his death, which occurred at Lisbon, October 26, 1751, whither he had gone for the benefit of his health. D. was a man of the most amiable character, deep piety, and extensive accomplishments. His principal work is *The Rise and Progress of Religion in the Soul* (1750). It has been translated into Dutch, German, Danish, and French. Besides this, may be mentioned *The Family Expositor* (6 vols., 1760—1762); his *Course of Lectures*, delivered to the students under his charge, and published by the Rev. Samuel Clarke (1763); and a great variety of sermons on miscellaneous religious topics. D. also wrote a considerable number of hymns, which hold a high rank among those used by English and Scotch dissenters.

**DODE'CAGON.** A regular polygon of twelve equal sides and angles. See REGULAR FIGURE.

**DODECAHE'DRON**, one of the five regular solids, is bounded by twelve equal and regular pentagons. See REGULAR BODY.

**DÖDERLEIN, LUDWIG**, a German philologist, was born at Jena, 19th December 1791; studied at Munich, Heidelberg, Erlangen, and Berlin; and in 1815 was appointed professor of philology at the academy of Berne. About the year 1820, he went to Erlangen as second professor of philology, and in 1827 became first professor and also director of the philological seminary. His principal works are *Lateinischen Synonymen und Etymologien* (6 vols., Leip. 1826—1838); *Lateinischen Wortbildung* (Leip. 1838); *Handbuch der Lat. Etymologie* (Leip. 1841); *Homerische Glossarium* (1 vol., Leip. 1850). D. has also edited several classical works such as the *Oedipus Colonneus* of Sophocles, and the *Opera* of Tacitus.

**DO'DO** (*Didus*), a genus of birds commonly ranked among the *Brevipennes* (q. v.) or Struthious birds (Ostrich, Cassowary, &c.), although exhibiting very anomalous peculiarities; but still more interesting because, whilst it appears to be now completely extinct, its extinction has taken place very recently, and through the agency of man; at least one species (*D. ineptus*) being known to have existed less than two hundred years since. It is described by several voyagers of the 16th and 17th centuries, and seems even to have been brought alive to Europe. It inhabited the islands of Bourbon and Mauritius. That any species of D. was ever seen by European voyagers in Madagascar, is not so certain; and the Solitaire (q. v.) of the island of Rodriguez, now also extinct, was a very different bird. The D., according to the descriptions given of it by those who saw it, and which are confirmed by pictorial representations, apparently not unworthy of confidence, was a bird larger than a swan; of a very heavy, clumsy form and corresponding gait, with short thick scale-covered legs; three rather short toes before and one behind; large head; very large bill, the upper mandible longer than the under, and much hooked at the point; the wings so short as to be of no use for flight, and furnished only with a few black feathers; the general plumage a kind of grayish-down; the tail merely a tuft or bunch of curiously curled feathers. The D. was so abundant when some of the first voyagers visited Mauritius, that they became satiated with its flesh, although they describe it, particularly the breast, as good for food. The birds were easily killed, being wholly unable to fly, and running slowly. Their speedy extinction after the islands began to be visited and settled, is thus easily accounted for. The D. seems to have been adapted for living in tropical woods, where the luxuriant vegetation afforded it a ready supply of food, and its powerful hooked bill, which has led some naturalists to assign it a place among birds of prey, was probably intended for tearing vegetable and not animal substances. However singular this bill is in a struthious bird, it has been well remarked that it is not more so than the very different bill of the *apteryx.*



Dodo.

There are rude figures of the D. in several works of the 17th c., and in particular one, evidently superior to the rest, in Bontius (edited by Piso, 1658)—who calls the bird *Dronte* or *Dodaers*—which perfectly corresponds with the descriptions given of it, with a painting preserved in the British Museum, said to have been drawn in Holland from the living bird, and with a representation of it discovered by Professor Owen in 1838 in Savery's picture of Orpheus and the Beasts at the Hague, which he thinks 'must have been copied from a study of the living bird.'

A foot of the D. is amongst the valued treasures of the British Museum; a head and a foot are preserved in the Ashmolean Museum at Oxford. It must ever be cause of regret, that a stuffed specimen which once existed in the Ashmolean Museum was allowed to decay, and finally destroyed in 1755 by order of the curators, who little imagined that portions of it escaping their sentence were to become objects of the highest interest to the whole scientific world.

**DODO'NA,** a city of Epirus, the seat of the oldest Grecian oracle there, is situated in one of the wildest districts south-west of the Lake of Janina. The Greek and Egyptian accounts of its origin differ. The priests of Jupiter in Egyptian Thebes related that two holy women were carried off from that city by a party of Phœnicians, one of whom was sold in Lybia, the other to the Greeks, and that these women founded the oracles at D. and Ammon. The inhabitants of D. related that two black doves took their flight from the city of Thebes, in Egypt, one of which flew to Lybia, the other to D.; that the latter perched upon an oak, and with a human voice commanded that an oracle should be founded on the spot. Herodotus is of opinion, that if the Phœnicians did actually carry off the two women already alluded to, one of them was probably sold into Greece; that the strange language and dark complexion had caused them to be likened to birds; and that when they became acquainted with the Greek tongue, they were said to have spoken with a human voice. Later authors ascribe the founding of the city to Deucalion. The sanctuary itself was dedicated to Jupiter, who manifested himself from the boughs of an oak, probably by the noise of the wind through the tree. This was explained by the priests, who were termed Selloi or Helloi. The goddess Dione, by some said to be Aphrodite, by others Hera, afterwards appeared by the side of Jupiter, and the place of the priests was occupied by priestesses, who announced the will of the deity. D., though not equal in renown to Delphi, was yet frequently consulted on occasions of importance both by the Spartans and Athenians. Though the city of D. was destroyed in 219 B.C. by the Ætolians, it recovered at a later period, was visited by the Emperor Julian on his march to Persia, and was in existence in the 6th C. A. D.

**DO'DSLEY,** Robert, author and publisher, was born in 1703 near Mansfield, in Nottingham. His father, who is said to have been a schoolmaster, apprenticed him to a stocking-weaver; but finding this employment unsuitable, D. ran away, and was afterwards engaged as footman. While thus employed, he devoted his leisure moments to reading and the cultivation of letters, and eventually published, in 1732, a volume of poems, entitled *The Muse in Livery, or the Footman's Miscellany.* His next production, *The Toy Shop,* a dramatic piece, was submitted in manuscript to Pope, who undertook to recommend it to Rich, the manager of Covent Garden Theatre. It was acted under Rich's management in 1735 with great success. The proceeds resulting from the publication of these his first two works enabled D. to commence business as a bookseller, in which trade he was very successful. In 1737, his *King and the Miller of Mansfield* was brought out at Drury Lane, and met with an enthusiastic reception. This was followed by *Sir John Cockle at Court, The Blind Beggar of Bethnal Green,* and *Rex et Pontifex,* which were republished in a collected edition of his dramatic works with the title of *Trifles* (1748). Meantime, he was conducting his business with such ability and spirit, that in the course of three years after commencement he was in a position to buy copyrights. In 1738, he bought Johnson's *London,* giving for it no more than ten guineas. His most successful work was a tragedy called *Cleone,* which was acted at Covent Garden with extraordinary success. On its publication, 2000 copies were sold the first day, and within the year the work ran through four editions. With *Cleone* he closed his career of dramatic authorship. D. was connected either as contributor or publisher, and occasionally as both, with several magazines. He is, however, chiefly remembered now on account of his *Select Collection of Old Plays* (12 vols. 8vo, 1780); and his *Collection of Poems by Several Hands* (4 vols. 12mo, 1748). Besides the volume entitled *Trifles,* another volume of his collected works was published in 1772 under the title of *Miscellanies.* He died at Durham while visiting a friend, on the 25th September 1764.

**DOE,** John, the fictitious plaintiff in ejectment, whose services are dispensed with since the abolition of the fiction.—Wharton's *Law Lexicon.*

**DO'FFER** is that part of a carding-machine which takes the cotton from the cylinder when carded. See Carding.

**DOG** (*Canis*), a genus of digitigrade (q. v.) carnivorous (q. v.) quadrupeds, which, as defined by Linnæus, included all that now form the family *Canidæ* (q. v.), and also hyænas. In the genus as now restricted, wolves and jackals are generally included by naturalists, along with those animals to which alone the name Dog is popularly applied, and a distinctive character of principal importance is found in the pupil of the eye, which is always round—contracting circularly, whilst in foxes it assumes the form of a section of a lens when contracted. The present article is limited to dogs in the common acceptation of the term, wolves and jackals being the subjects of separate articles; and only remarks relative to dogs in general will here find a place, many of the particular kinds being sufficiently important to be separately noticed.

At the very outset we encounter one of the most perplexing and difficult questions in natural history, as to the number of *species* of dog, and the origin of the domestic dog; two questions in appearance but rather one in reality, and one on which the opinions of the most eminent naturalists are very much divided. According to some, all domestic dogs are to be regarded as of one species; and as in the case of some other valuable domestic animals, that species is not certainly known to exist in a truly wild state, all the wild dogs which must be admitted to belong to the same species being viewed as the offspring of domestic dogs which have returned to a wild state, and in which, however, it is supposed that the original type or characteristics of the species, modified by domestication, have in a great measure reappeared. According to others, there are numerous species of dog, originally distinct, which have been domesticated by the inhabitants of different countries, but which, however, are very nearly related not only in their physical characters but in their dispositions and in some of their principal instincts, and which were capable of intermixing, not perhaps indiscriminately, but within certain limits, and so as to produce new races. By some who hold the first of these opinions, it is further maintained that the wolf and the dog are one species, and that all domestic dogs are derived from the wolf; whilst others advocate the claims of the jackal to be regarded as their original parent and type. By some of those who hold the species to be numerous, it is supposed not improbable that the blood of wolves and of jackals may be mixed in some of the domestic races with that of the original dogs.—It is impossible for us to do more than state these different views, and a few of the principal arguments by which they are supported.

It is admitted on all hands, that there is great diversity among the different kinds of domestic dogs, many distinct races having long existed, which differ not only in size and other physical characters, but to a notable extent also in dispositions and instincts; it is further admitted that there appear to be no definite limits to the possible intermixture of these races with each other. So great is the diversity of physical characters, that naturalists of the greatest eminence almost acknowledge themselves incapable of pointing out any that are common to all dogs, and yet distinguish them all from the different species of wolves and jackals; and in fact, the *recurved tail*, not apparently a character of the first importance, is named by Cuvier himself as the most certain and unvarying specific distinction. The obliquity of the eyes of wolves is also contrasted with the more forward direction of those of dogs, which is accounted for —in favour of the theory of wolfish origin—by the supposition that it results from 'the constant habit, for many successive generations, of looking forwards to their master, and obeying his voice.'—Bell's *British Quadrupeds.* This, on the other side, is treated with ridicule; it is certainly a transition from the region of observation and ascertained fact to that of mere theory and conjecture. In size, dogs differ so widely that one is not as large as the head of another; the difference in form of body, head, or limbs, is almost equally great between the Newfoundland Dog or the Mastiff and the Greyhound. The gradations, however, from one form or character to another, render it impossible to draw a fixed limit. In some races of dog, the hind-feet as well as the fore-feet have five toes, instead of four, which is more common; but this has not been much insisted on as a ground of specific distinction. Greater value ought perhaps to be attached to the want in some, as the Dholes (q. v.) of India, of the second tubercular tooth in the lower jaw; the hairiness of the soles of the feet of some is perhaps also not unimportant; and in favour of the opinion that domestic dogs have originated from an intermixture of several species, it has been urged that the number of teats in the female varies, and that there is sometimes even a difference between the number on one side and on the other, which has never been observed to be the case in wild dogs, and in them the number in the same kind is always uniform. Some of these points, however, have not received the investigation necessary to a confident determination of the measure of importance which ought to be assigned to them.

It seems to have been too hastily taken for granted, in favour of the opinion that there is only one species of dog, that all the wild races, even the dholes and the dingo, have sprung from domestic progenitors. There is certainly no evidence of this; and the fact that wild races exist, exhibiting marked diversities of character, in countries widely remote and of very different climates, is referred to with confidence on the other side, as affording at least a strong presumption in favour of the supposition that man has, in different countries, domesticated the species which he found there. We do not yet know enough of the amount and limits of the changes which circumstances and climate may produce, to warrant any confident conclusions on that ground. And if we were to adopt the views of those who ascribe least to such causes, we might yet demand them to shew why, although from certain original types no mixed race can originate, there may not yet be other original types capable of such combination, or why the limits must be held equally impassable between all that were framed by an original act of creation. That there was only one original pair of the human race, may be held, without our of necessity holding that there was only one original pair of dogs. But to this consideration due place has, perhaps, scarcely been given.

That the common fox—or any species of fox—is a parent of any race of dogs, is not the opinion of any naturalist. There are indeed some dogs, particularly of the Scottish shepherd-dog or *colly* race, which have a somewhat fox-like appearance; and a shepherd may sometimes be heard to speak of his dog as in part of fox-blood, but there is no well-authenticated instance of commixture between the fox and the dog. It is otherwise with regard to the wolf. Instances of commixture have certainly occurred, and without the compulsion of confinement; but such instances have apparently been very rare. Nor is it ascertained that the progeny is permanently fertile.

In favour of the specific identity of the dog and wolf, one of the strongest arguments is drawn from the equality of the period of gestation—63 days. But it may be remarked that an inequality of the period would have afforded a much stronger argument on the other side.

Against the identity of the dog and wolf, the difference of disposition has been strongly urged. In reply, it is shewn by well-authenticated instances that the wolf is very capable of that attachment to man which so remarkably characterises the dog. There is greater value, perhaps, in the argument of Colonel Hamilton Smith, that 'if domestic dogs were merely wolves modified by the influence of man's wants, surely the curs of Mohammedan states, refused domestic care, and only tolerated in Asiatic cities in the capacity of scavengers, would long since have resumed some of the characters of the wolf.'

Buffon's notion, that the shepherd-dog is the original type of the whole species, from which all dogs are derived, is merely fanciful, and his endeavour to support it by a comparative view of the different kinds, only exhibits a certain amount of ingenuity.

The shepherd's dog is one of the kinds of dog having greatest development of brain, but it is still greater in the spaniel. The skulls of dogs, however, neither exhibit very marked distinctions when compared with each other, nor when compared with those of wolves and jackals.

It is universally believed that the diversity of colour exhibited by many dogs is a result of domestication, as it is neither found in those which may be supposed to exist in a state of original wildness, nor in those wild races which are certainly known to be the progeny of domestic dogs, a return to uniformity of colouring being apparently one of the most speedy consequences of a return to wildness. Black, reddish-brown, and white, the uniform colours observed in wild dogs, are, however, the colours which chiefly appear mixed in domestic races.

Pendulous ears are generally regarded as another result of domestication in dogs, as in rabbits; and it is certain that the wild races known have erect and pointed ears; but no wild race has been discovered at all corresponding to the mastiff in some of its other most notable characters, particularly the shortness of the muzzle, and depth of the chops, and it has therefore been conjectured that this and kindred races may have derived their origin from some wild dog of the interior of Asia, which has not yet come under the notice of any scientific observer.

The dog has been a domestic animal from a very early period. The earliest allusions to it are in the books of Moses, but they indeed correspond with the dislike and contempt still commonly entertained for it by many of the nations of Southern Asia. By Homer, however, it is very differently mentioned; and 'there is not a modern story of the kind which can surpass the affecting simplicity with which the poor dog's dying recognition of his long-lost master is related by one who wrote, probably, not less than 2700 years ago.' The sculptures of Nineveh, and the hieroglyphics of Egypt, attest the very early domestication of the dog, and the existence of races similar to some of those which exist at the present day; and the high value attached to it by many nations is further attested by the place assigned to it, or its image, as emblematic of the attributes which they ascribed to their gods. We do not now set so high a value on the dog, in consideration of mere usefulness to man, as on some of the other domestic animals; yet to the savage it is perhaps the most important of all, and some have supposed that by its aid the subjugation of other animals may have been first accomplished. Cuvier makes the strong assertion, that the dog 'is the most complete, the most singular, and the most useful conquest ever made by man.' The dog, far more than any other animal, becomes a humble friend and companion of man, often seeming actually to know and sympathise with the joys and sorrows of his master; and on this account it is, that he is alike 'the pampered minion of royalty and the half-starved partaker of the beggar's crust.'

The uses to which the dog is applied are numerous, and correspond, in some measure, not only with distinct physical characters, but with remarkably distinct instincts of different breeds. Thus, whilst in some countries dogs are chiefly employed as beasts of draught, particularly for drawing sledges in the frozen regions of the north; and in other countries chiefly for the chase, the exquisite scent of some kinds, and the remarkable fleetness of others, variously recommending them for this use; we find them also rendering important services in the care of sheep and other cattle, and endowed with hereditary instincts wonderfully fitted for this purpose, and we find them, with like adaptation of instinct, highly valuable in watching and protecting the abodes and properties of their masters. Not the least interesting of the employments to which the dog has been devoted by man, is that of leading about the blind, which is often done with an intelligent and affectionate solicitude highly worthy of admiration.

Anecdotes illustrating not only the instincts, but the intelligence and affection of dogs, are familiar to every one, and form one of the most pleasing parts of many a book of natural history. Attractive to children, they are worthy of all the consideration which they can receive from the most philosophic mind. Volumes have been filled, and more volumes might easily be filled, with anecdotes well authenticated, and well worthy of preservation.

The dog produces usually from six to ten young ones at a birth. They are born blind, open their eyes about the tenth or twelfth day, attain their full growth in about two years, seldom live more than twelve or fifteen years, and almost never more than twenty.

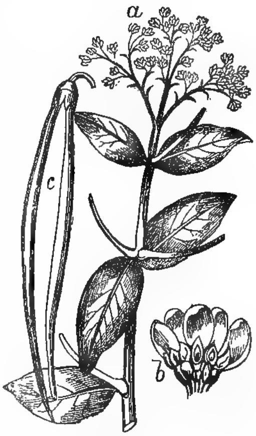
No satisfactory classification of the different kinds of dog has ever been made. What some naturalists regard as types of species, others pronounce to be mere mongrel races. Nor can any principle of arrangement be found in form, roughness or smoothness of fur, or other such character, which will not associate kinds that are in other respects widely dissimilar, and separate some that are nearly allied.

Colonel Hamilton Smith arranges domestic dogs in six groups or sections: 1. 'The Wolf Dogs,' including the Siberian Dog, Esquimaux Dog, Iceland Dog, Newfoundland Dog, Nootka Dog, Sheep Dog, Great Wolf Dog, Great St Bernard Dog, Pomeranian Dog, &c. 2. 'The Watch and Cattle Dogs,' including the German Boar-Hound, Danish Dog, Matin, Dog of the North American Indians, &c. 3. 'The Greyhounds,' including the Brinjaree Dog, different kinds of Greyhound, Irish Hound, Lurcher, Egyptian Street Dog, &c. 4. 'The Hounds,' including the Bloodhound, Old Southern Hound, Staghound, Foxhound, Harrier, Beagle, Pointer, Setter, Spaniel, Springer, Cocker, Blenheim Dog, Water Dog or Poodle, &c. 5. 'The Cur Dogs,' including the Terrier and its allies. 6. 'The Mastiffs,' including different kinds of Mastiff, the Bull Dog, Pug Dog, &c. Colonel H. Smith does not include in any of these groups the dholes, dingo, &c., which he even separates from the genus *Canis*.—Mr Richardson arranges dogs in three great groups, 'indicated by the least variable part of their osteological structure, cranial development.' 1. Including the Irish Wolf Dog, Highland Deerhound, all kinds of Greyhounds, and the Tiger Hound, characterised by *convergent* parietal bones, an elongated muzzle, and high and slender form. 2. Including the Great Dane, the French Matin, the Pariah of India, the Bloodhound, Staghound, Foxhound, Harrier, Beagle, Pointers, Terriers, Turnspit, Newfoundland Dog, Labrador Dog, Pomeranian Dog, Esquimaux Dog, Siberian Dog, Iceland Dog, Shepherd's Dog, &c., characterised by *parallel* parietal bones, and generally by much acuteness of smell. 3. Including Mastiffs, the Great St Bernard Dog, Bull Dog, Pug Dog, &c., characterised by sensibly *divergent* parietal bones, bulk of body, robust structure, and combative propensities.

DOG (in Law). The keeping of vicious or destructive dogs, or other animals, except under proper precautions, is illegal; and the proprietor is liable for the damage which they occasion in all cases in which it cannot be clearly shewn that the fault lay with the party injured. Even before the injury occurs, it is competent to enforce measures of precaution. If a man have a dog which he knows to be of a savage nature, and addicted to bite, and he allow it to go in a frequented place without being muzzled or otherwise guarded so as to prevent it from committing injury, he may be indicted in England as for a common nuisance. If the dog be of a ferocious kind, as a mastiff, it has been held that he must be muzzled (1 Russ. 303); and it will be no defence in an action of damages against the master, that the person injured trod on the dog's toes, for he would not have trodden on them if they had not been there (3 Car. and P. 138). The harbouring of a dog about one's premises, or allowing him to resort there, will warrant indictment (M'Hone and Wood, 5 C. and P. 2). If a dog known to his proprietor to have previously bitten a sheep, be retained by him, the proprietor will be liable to all subsequent injuries even to other animals, as, e. g., a *horse*. (Burn's *Justice of the Peace*, vol. ii. p. 333.) In Scotland, a warrant may be obtained, on proof of vicious practices and danger to the public, either from the sheriff or the justices, on a summary complaint, to have a dog secured or slain, and the owner found liable in expenses. The complaint may be at the instance either of the fiscal or of a private party, with or without the fiscal's concurrence. An interdict may be granted against the dog going loose pending the discussion of the question as to whether or not he ought to be killed. Many local police acts contain provisions as to shutting up or muzzling dogs during the prevalence of weather likely to produce hydrophobia; and where such do not exist, the subject may be dealt with by the magistrate at common law. Formerly, the common law of England held that it was not larceny to steal any of the baser animals, in which class all dogs, except those of value, were included. But by 7 and 8 Geo. IV. c. 29, dog-stealing was declared to be an offence punishable by fine. This act was repealed, and new regulations of a more stringent kind made by 8 and 9 Vict. c. 47. By that enactment dog-stealing is a misdemeanour, punishable, on summary conviction, for the first offence, by six months' imprisonment and hard labour, or fine not exceeding £20 beyond the value of the dog. The second offence is an indictable one, punishable by fine or imprisonment and hard labour not exceeding eighteen months, or both. Similar punishment is provided for persons found in possession of dogs or dogs-skins, knowing them to have been stolen. A dog going into a neighbour's field does not afford ground for an action of trespass unless he does mischief; and even then the person who kills him in certain circumstances, may be liable in damages (2 Marsh. 584). The use of dogs for purposes of draught was prohibited under a penalty by 2 and 3 Vict. c. 47, which is explained by 17 and 18 Vict. c. 60, § 2. See CRUELTY TO ANIMALS.

*Tax on Dogs.*—The duty charged on every dog is 12*s*. The maximum charge for any number of hounds, £39, 12*s*., and for any number of greyhounds, £9. Any dog kept wholly for the care of sheep or cattle, if not a greyhound, hound, pointer, setting-dog, spaniel, lurcher, or terrier, and all dogs under six months' old, are exempt from duty. See GAME LAWS.

DOG'BANE (*Apocynum*), a genus of plants of the natural order *Apocynaceæ*, having bell-shaped flowers, no style, and the fruit a long linear follicle. Some of the species are shrubby, some herbaceous; some extend into colder climates than is usual for plants of this order. The D. of North America (*A. androsæmifolium*), a perennial herbaceous plant, about four feet high, with smooth stem, much milky juice, smooth ovate leaves and whitish rose-coloured flowers, growing in open barren places from Georgia to Canada, is valued for the medicinal properties of the bark of its root, which is emetic, diaphoretic, and in small doses tonic. The root of CANADIAN HEMP (*A. cannabinum*), a plant noticed on another account in the article *Apocynaceæ*, possesses similar properties, and is frequently used in the United States.



Dogbane:
*a*, end of branch, with leaves and flowers; *b*, a flower cut open; *c*, fruit.

DO'G-DAYS. See CANICULAR DAYS.

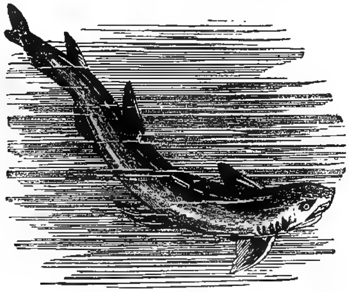
DO'G-DRAW. An apparent deprehension of an offender against venison in the forest. Dog-draw is where any man hath stricken or wounded a wild beast by shooting with a cross-bow, long-bow, or otherwise, and is found with a hound or other dog drawing after him to receive the same.—Cowel's *Interpreter*.

DOGE (equivalent to *duke*) was the name of the chief magistrate, possessing princely rank, in the republics of Venice and Genoa. Dogate or dogado, both from the Latin *ducatus*, duchy, is used to indicate the dignity of doge. We find doges of Venice elected by the people, but enjoying almost the rights of absolute monarchs, as early as the beginning of the 8th century. Their power, however, was considerably reduced towards the end of the 12th c., through the creation of a Great Council, composed of 470 members, chosen from nobles as well as citizens, and invested with legislative power. These afterwards appointed six of their own number to superintend the doge in the exercise of his executive power. Further, the *pregadi*, or nobles, who formerly were admitted by the doge to a share in the public affairs, were organised into a regular board of administration, numbering 60 members. By the new constitution, the people, too, lost the most essential of their rights—viz., the right of electing the doge. This right was now changed into a privilege belonging exclusively to the Great Council, whose members elected 24 from among themselves, and these latter again elected, by ballot, 12 of their own number, upon whom devolved the right of appointing a doge. Sebastiano Ziani was the first doge thus elected, 1177; and on the occasion of his elevation to office, he scattered money among the people, to console them for the loss of their rights—an act which was imitated by his successors, and soon became a recognised custom, as was also the case regarding the manner in which he went through the ceremony of wedding the Adriatic Sea. The Pope Alexander III., whom, during his quarrels with the Emperor

Frederic I., the doge had faithfully supported, sent him, together with other privileges, a ring, as the symbol of domination the republic had acquired over the Adriatic. Accordingly, a marriage-ceremony took place on Ascension Day—a ring being thrown from the ship *Bucentaur* into the sea, to shew that as the wife is subject to her husband, so is the Adriatic Sea to the republic of Venice.' The practical bearing of the ceremony soon appeared in the shape of stringent measures, regulating the navigation of the Adriatic, and imposing tribute upon all foreign ships. The power of the doge underwent, in 1179, a signal modification; the Treble Quarantia—a high court of justice, composed originally of 40 members—having been erected, as also the board of *Advogadori*, for the settlement of fiscal questions instituted. During the reign of Jacopo Tiepolo (1229—1249), a new restriction arose from the creation of an independent police, and a still greater one from the formation of a tribunal consisting of three inquisitors and five correctors, who, on the demise of a doge, had to examine his conduct, sifting the minutest particulars of his private life. All these changes were effected by the Great Council, to the thorough exclusion of the people. In 1268, the Great Council, in order to cut short all family influence upon the affairs of the state, devised a curious and extremely complicated mode of election; but notwithstanding the limitations new and old, the power of a doge continued great, if he was only wise enough to profit by the contentions between nobles and citizens, the disputes of the different authorities, and especially by his own position as commander-in-chief of the forces and high-admiral of the navy. This last prerogative of the doge remained in vigour up to 1628, when, by a formal enactment, the doge was prohibited the exercise of such command, unless he were authorised by the Council of Forty. Other privileges, however, belonging originally to the dogate, were abrogated or circumscribed long before this, and especially during the period 1289—1311. Thus, at the instigation of the doge, Gradenigo, who was actuated by jealousy towards the mighty family Tiepolo, the famous law of 'closing the Great Council' was passed, and by it the whole legislative and judicial power made the heirloom of those families whose names were inscribed in the Golden Book, or *Libro d'Oro*. About that time (1309), ecclesiastics of any degree were declared unfit for political or judicial functions. To counterbalance the influence of discontented nobles, a public feast was instituted—to come off yearly—at which the doge gave a dinner to the fishermen, fraternising with them in testimony of equality. Shortly before Gradenigo's death, that terrible tribunal, the Council of the Ten, was erected, which was to be the highest in the state, irresponsible, and entitled to pass judgment upon the doge himself. In the meanwhile, the Great Council managed to get the functions, public as well as private, of the doge circumscribed in the minutest way. It was ordered that the doge should not announce his accession, except to the princes of Italy; neither was he permitted the opening of dispatches emanating from the popes or from princes; the kissing of his hands, or kneeling down in his presence, was strictly interdicted. He could not leave town, be possessed of real property abroad, or allow his children to contract matrimonial connections with foreign houses, accept donations, &c. He had to submit to the continued presence of two *advogadori*, to be fined for the least mistake, and bear the expenses of the ducal dignity from his own purse. To all these restrictions and burdens the doge declared himself liable on the occasion of his coronation, by signing a document headed 'Promissione.' The state costume and retinue of the doge were minutely defined, and a trifle fixed as his salary. As a symbol of princely dignity, the doge wore a horned cap, and had the title of Serenity. The credentials of ambassadors were written in his name, but signed by a secretary of state, and sealed with the arms of the republic. The money was struck in his name, but not with his stamp or arms. All the magistrates rose and saluted the doge when he came into council, and the doge rose to none but to foreign ambassadors. His family was exempt from the jurisdiction of the Master of the Ceremonies; and his children, though excluded from public offices, were allowed to have staff-officers, and gondoliers in livery. After the death of And. Dandolo, 1354, on a motion from the correctors, the three presidents of the quarantia, and later six ministers, were joined to the six privy-councillors of the doge, who, together with the above-named, has formed henceforward the so-called Signoria Serenissima. At that stage the rank of doge could no longer be an object of ambition, and as early as 1339 a law was necessary to prohibit the doge elected from resigning his place. And. Contarini, 1367, accepted the proffered dignity only upon the threat of being declared a traitor to the country. In 1413, by a law emanating from the Great Council, the doge was even denied the title of Signoria, that of Messere being substituted instead; at the same time he was deprived of the right of convening an *arengo* or meeting of the people. With the fall of the Venetian republic, 1797, the dignity of doge also disappeared. There were in all 73 doges at Venice, the first of whom, Anafeste (Paoluccio), was elected 697; the last, Manin (Lodovico), 1788. In the Palazzo Ducale, the celebrated frieze of the doges is to be seen round the Sala del Maggior Consiglio, exhibiting 72 portraits, and one space covered with a black veil, with an inscription, indicating that Faliero (Marino) was beheaded for high treason.

The republic of Genoa elected, after a victory gained by the party of the people (1339), Simon Boccanera for its first doge. He was elected for life, and with absolute power, of which, however, he allowed a share to 12 aldermen (*anziani*), the one half being chosen from the *cittadini* (citizens), the other among the *nobili* (nobles). In the long run of centuries, the power, duration, and splendour of the ducal seat underwent frequent changes, arising from the vicissitudes of the state and the hostilities between the popular and aristocratic parties. A constitution for defining the functions and prerogatives of the doge was framed in 1528, after the great victory of And. Doria over the French. According to this constitution, which, with slight modifications, remained till the end of the Republic, the dignity of doge was of two years' duration, under restrictions similar to those at Venice. The candidate was to be a noble, and at least 50 years of age. The doge presided, with the right of veto, in the sittings of the Great Council, composed of 300 members, as also in those of a smaller one, consisting of 100. These two councils exercised the legislative power, whereas the executive was vested in the doge, together with 12 *governadori* and 8 *procuratori*, among these latter being always the doge retiring. During the time of his government, the doge resided in the state palace, where he was liable to the same restrictions and ceremonies which were in use at Venice. When, in 1797, Genoa was occupied by the French, the dogate ceased to exist; in 1802, the Genoese Republic being, conjointly with the Ligurian, re-established, the ducal dignity was once more resuscitated; but in 1804, it disappeared for ever, the Republic itself having been dissolved.

**DO'GFISH**, the popular name of some of the smaller species of shark; apparently owing its origin—like the names Porbeagle, Hound, &c., bestowed on others of the same family—to their habit of following their prey like dogs hunting in packs. Of the species to which the name D. is given on the British coasts, one of the most abundant is that sometimes called the COMMON D. (*Acanthias vulgaris*), also known as the PICKED (i. e., piked or spined) DOGFISH. It belongs to the family *Spinacidæ*, of which one characteristic is the presence of a spine before each of the two dorsal fins; and which is further characterised by having spiracles or spout-holes; by having five gill-openings on each side all before the pectoral fins; and by having no anal fin, and no nictitating membrane of the eye. The body is long and tapering; the head flat; the snout conical; the teeth in both jaws sharp-edged, and formed for cutting. The tail-fin is longer than it is broad. The upper parts are slate-gray, the under parts yellowish-white; the skin very rough when rubbed from tail to head, but seeming quite smooth when rubbed in the contrary direction. This fish uses its spines in a remarkable manner, bending itself into the form of a bow, and unbending with a powerful spring; and 'if a finger be placed on its head, it will strike it without piercing its own skin.' It attains a length of three or four feet. It is very widely distributed, being found in the Atlantic, the Mediterranean, and the South Seas. It causes great annoyance to fishermen, by cutting the hooks from their lines, and still more by frightening away the shoals of herring, in which other kinds of D. share the blame with it. It sometimes appears in prodigious numbers; 20,000 have been taken in a net at one time on the coast of Cornwall; and the fishermen of the Orkneys and Hebrides sometimes load their boats to the water's edge with them. The flesh, although coarse, is dried and eaten; the livers yield oil, and the refuse parts are used as manure.—The other British dogfishes belong to the genus *Scyllium*, of the family *Scylliidæ*, which have an anal fin, and two dorsal fins placed far back. They resemble in general form the species just described, and like it, they have the tail-fin longer than it is broad—they have five gill-openings on each side—the last of which, however, is over the base of the pectoral fin. They have spout-holes, and no nictitating membrane; but their teeth are very different, having a long central point, with shorter points on each side. The SPOTTED D. of two species (*S. canicula* and *S. catulus*), both of a generally reddish-brown colour, and marked with dark spots, is often taken with bait on all parts of the British coasts; and although almost never brought to market, is much used for food in the Orkney Islands. It has been suggested that the fins of these and other sharks might be used for making gelatine soup, as in China.



Dogfish.

**DO'G-FOX**, a name sometimes given to certain small animals of the family *Canidæ*, allied to the *Corsac* (q. v.), and, like it, referred to the genus *Cynalopex*. They have a sharp muzzle, not unlike that of a greyhound, rather large, erect, pointed ears, the pupil of the eye contracting circularly as in the dog, the tail bushy like that of a fox. They inhabit warm parts of Asia and Africa; and some, if not all of them, burrow.

**DO'GGER** is a vessel something like a galliot or a ketch, used by the Dutch as a fishing-boat in the German Ocean. It is not certain whether these were named after the Doggerbank, or *vice versâ*.

**DO'GGERBANK**, an extensive flat sand-bank in the middle of the German Ocean, between England and Denmark, in lat 54° 10′—57° 24′ N., and long. 1°—6° 7′ E. It stretches 320 miles east-north-east, from 12 leagues east of Flamborough Head to within 20 leagues of Jutland. A prolongation runs east towards Horn Point, Denmark. The bank is in some parts 60 miles broad, but the average breadth is 40. Towards the English coast, it is only 9 fathoms deep, in some parts it is 30, but the average depth is 15 to 20. The surrounding sea is in many parts 24 to 60 fathoms deep. The surface of the bank consists chiefly of fine sand and ooze. It is the seat of important English and Dutch cod-fisheries. At the south end of D., in 1781, occurred the indecisive naval fight between the Dutch and English fleets, under Admirals Zoutman and Parker respectively.

**DOGGET'S COAT AND BADGE.** These form a prize at a rowing-match on the Thames every year on the 1st of August. The prize is a bequest of Thomas Dogget, an actor of Drury Lane Theatre, who desired to signalise the accession of George I. to the throne (August 1, 1715) by a prize of a waterman's coat and badge. Such is the account usually given; it would appear, however, from the following notice in the *Times* newspaper (August 2, 1861), that there are several prizes rowed for on this occasion. 'The first prize is a livery and badge given by Mr Thomas Dogget, deceased, to which the Fishmongers' Company add a guinea. The second and third prizes are respectively five-eighths and three-eighths of the interest on £260, 17*s.* 3*d.*, formerly £200 South Sea Stock, left in the will of Sir William Jolliffe, the amounts respectively being £4, 17*s.* 9*d.* and £2, 18*s.* 9*d.* The prize for the fourth man is £1, 11*s.* 6*d.*, and for the fifth and sixth men each £1, 1*s.*, the last three given by the Company.' Besides these prizes, additional sums are occasionally given by private individuals to the winner, or to the first, second, and third in the race. The competition is by six young watermen whose apprenticeships have expired the previous year; each being in a boat by himself, with short oars or sculls. The barge-master of the Fishmongers' Company is ordinarily the umpire. The competition takes place when the current of the Thames, by recession of the tide, is strongest against the rowers; and the race, which is from London Bridge to the Old Swan at Chelsea, always excites much local interest, being one of those manly sports in which the English take much pleasure.

**DO'G-GRASS.** See COUCH-GRASS.

**DOGLIA'NI**, a town of Piedmont, Northern Italy, is situated in a mountainous district on the left bank of the Rea, 12 miles north-east of Mondovi. D. has the remains of an old castle, but no other buildings worthy of note. Here five annual fairs are held, at which cattle, hemp, and victuals are chiefly sold. Pop. 5000.

**DO'GMA** (Gr.), meant originally an opinion or proposition, put in the form of a positive assertion, its truth being supposed to have been previously shewn. In theology, it was understood to signify a doctrine founded on Scripture, and advanced not for discussion but for belief. But as this method of stating truth easily degenerates into the assertion of opinions without ground, and without regard to the aspect they may present to others, *dogma* and *dogmatism* have come in English to be almost synonymous with assertion without proof.

In continental theology, however, the word is still used without implying any censure, Dogmas (Ger. *dogmen*) meaning simply doctrines; and this is the case in our own expression, Dogmatic Theology, or Dogmatic, which is that branch of theology that treats of the systematic arrangement of the doctrines of Christianity. Older names for the same thing were *Loci Theologici* and *Theologia Positiva.*—The first attempt to give a connected view of Christian doctrine was made in the 3d c. by Origen in his work *De Principiis.* He was followed in the 4th c. by Augustine, who in his book *De Doctrina Christiana,* and others, treated of the whole body of doctrine held by the church, though without any very scientific arrangement. The contributions to Dogmatic, made in the 5th, 6th, and 7th centuries, were mere collections of 'sentences.' In the East, in the 8th c., the doctrines of the Greek Church were treated by John of Damascus in a form already Aristotelian, and his work may be considered the first systematically arranged treatise on Dogmatic. He makes no mention of purgatory. His book was as influential in the Greek Church as the writings of Augustine in the Latin. The regular systematising of doctrines began with the SCHOLASTICS in the 11th c., but degenerated often into hair-splitting. The first cultivators of Dogmatic theology among the Scholastics were Hildebert of Tours and Abelard, who were followed by Petrus Lombardus, Alexander de Hales, Thomas Aquinas, Duns Scotus, &c.

The era of the Reformation awoke Dogmatic to a new life, leading it back from Aristotle to biblical theology. But the controversies between the different churches in the 17th c., and the too great importance attached to Confessions of Faith, cramped anew its freedom, and gave it again a Scholastic turn. Many of our still standard treatises on systematic divinity wear traces of these fetters, and contrast strikingly with the independence and vigour of inquiry displayed in the similar works of Melanchthon, Calvin, and other reformers. A fresh revival followed in Germany the spread of the critical philosophy of Kant, when biblical theology rose up in contradistinction to the theology of confessions, and dogmatic was grounded on the critical interpretation of Scripture rather than on traditional formulas. Hence, however, have sprung widely diverging views. One party still held fast by the existing confessions; another looked chiefly to the contents of Scripture; while a third subjected confessions and Scripture alike to the test of reason. Besides these, there arose in more recent times, a school of dogmatic theologians, formed on the philosophical systems of Jacobi and Schelling, who looked for the essence of religion in the human soul itself, and considered Christianity as the historical revelation of it. Of this school, Schleiermacher, and in some respects Neander and Rothe also, may be considered the representatives; and of all the German schools, it is that which seems to be exercising the greatest influence on the speculative theology of Britain. The most recent important work in this department of theology is Peter Lange's *Philosophische Dogmatik* (2 vols., Heidelb. 1849—1851). The Dogmatic of D. F. Strauss is constructed from the Hegelian point of view, and in its leading results comes back to the system of Spinosa.

It deserves remark that Christian dogmatic and morality, which it had been the custom to discuss separately since the 17th c., have recently been treated in combination by Nitsch and Beck. The scientific investigation of Christian doctrine in Germany has not been confined to the Protestant churches. A number of Catholic theologians have occupied themselves with this branch of sacred science; some, as G. Hermes of Bonn, inclining to freedom of investigation, and others, as Liebermann, to the defence of the usual formulas.

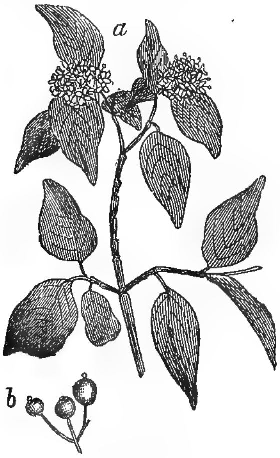
The HISTORY OF DOGMAS OR DOCTRINES has been raised in Germany to the rank of a distinct branch of sacred science. In this country, the facts with which it deals have received only passing notice in treatises on systematic theology, and in ecclesiastical history have been considered as the 'internal history of the church.' The pursuit of this branch of inquiry is characteristic of Protestantism; in the Catholic Church, it is considered as endangering the unity of the faith. Many Protestants even dislike the idea of a 'development' of Christian doctrine, which seems to be involved in its having a history. It is not necessary, however, to believe that doctrines hitherto absolutely unknown or denied, came from time to time to be embodied in the orthodox creed of Christendom. See DEVELOPMENT. Though this may be denied, it remains an indisputable fact that the several doctrines came one after the other into prominence in the consciousness of the church; and that in each period of her history there is some one leading doctrine which assumed an importance, as if it were the mainstay of Christianity. To depict this succession or evolution of views with their struggles and modifications, and trace the different ways in which the several doctrines were at different periods formulated and embodied in the creeds, is the object of a History of Doctrines (Ger. *Dogmengeschichte*). There is, of course, room for great variety in the method of treating such a subject. One of the most important works on this subject is Neander's *Dogmengeschichte,* edited by J. L. Jacobi, Halle, 1856; a translation of which into English was published by Bohn, 2 vols., 1858.

**DOGS,** ISLE OF, or *Poplar Marshes,* a small peninsula in the county of Middlesex, England, formed by a circuitous winding of the Thames, is situated in the vicinity of London, distant three and a half miles east-south-east from St Paul's Cathedral. It is about a mile long, and three-quarters of a mile broad. In what may be called the isthmus of the peninsula are situated the West India Docks. It is said that the Isle of Dogs derives its name from the circumstance that the king's hounds were formerly kept here. This tradition, however, is not well authenticated.

**DO'G-SHORE.** See LAUNCHING.

**DO'G'S-TAIL GRASS** (*Cynosurus*), a genus of grasses having a pretty close spike or ear, each spikelet with two equal glumes and 3—5 florets, and beneath each spikelet a comb-like bract or involucre. The species, which are not very numerous, are chiefly natives of Europe and Asia. Two are found in Britain, but one only is common and valuable, the CRESTED D. G. (*C. cristatus*), which forms an important part of almost all good pastures, and is particularly esteemed for sheep-pastures and lawns, for the improvement of which it is often sown. Its herbage is fine and close, and its deep roots secure it against droughts, which cause many other grasses to wither; but the herbage is not sufficient in quantity to make it desirable for hay.—The comb-shaped bract connected with each spikelet of this common grass is a very interesting and beautiful object. The seeds are small, shining, and yellow, whence the name *Gold-seed* sometimes given to this grass by farmers.

**DO'GWOOD**, or **DO'GBERRY**, the name usually given to some of the arboreous and shrubby species of the genus *Cornus*. See Cornel. The common D. of Europe (*C. sanguinea*), a native of Britain and many parts of the continent, and also of the north of Africa, is a shrub of 4—15 feet in height, with ovate leaves, and terminal cymes of greenish-white flowers, which have an unpleasant odour. The leaves become of an intense dark-red colour before they drop off in autumn. The wood makes the very best charcoal for gunpowder. It is very hard, and is made into skewers for butchers and cooks, and into cogs for wheels. The young wood was, in former times, in request for the making of arrows. The fruit, which is small, dark purple, and very bitter, yields an oil said to be equal to that of the olive, and to the amount of 34 per cent. of its weight. This oil is used in France for lamps, and for the manufacture of soap.—The D. of North America (*C. florida*) is a small tree, found in the United States, from lat. 43° to Florida, with oval leaves, and small yellowish flowers, which are surrounded by large white roundish bracts. The berries are red, and remain on the tree most of the winter. The flowers appear before the leaves, and their large white bracts are amongst the ornaments of the American woods in spring. The tree attains a height of 20—30 feet, with a trunk 8 or 10 inches in diameter. The wood is white, hard, fine-grained, much esteemed and used for inlaying and ornamental work. The bark is very successfully employed in the cure of intermittent fevers. It is also a valuable tonic. It is one of the most valuable medicinal products of North America. The barks of several other North American species of *Cornus* possess similar properties.—Jamaica D. is *Piscidia erythrina*, of the natural order *Leguminosæ*, sub-order *Papilionaceæ*, a good timber-tree, with hard and resinous wood, which lasts well either in or out of water; the bark of the root powerfully narcotic, used for stupifying fish, and also for relieving toothache, being applied to the tooth in the form of a saturated tincture, or taken into the stomach as a powerful sudorific.



Common Dogwood:
*a*, branchlet, with leaves and flowers; *b*, fruit.

**DOI'LEY**, or **DOI'LY**, a small napkin used at table for putting glasses upon during dessert. Some are highly ornamented. The name is said to be derived from the original maker; but more probably it is a modification of the Dutch *dwaele*, a towel, and was introduced along with the article from Holland.

**DOIT**, a small copper coin current in Scotland during the reigns of the Stuarts. It was a Dutch coin (*duit*), and in value the 160th part of a guilder, which, estimated at 20*d*. sterling, would make the doit equal to the eighth of an English penny, or half a farthing. By some authorities it is said to have been worth only the twelfth of a penny; in reality, it is difficult to say what was its worth, for being imported, like many other coins of the period, from Holland, it would rise and fall in value according to the scarcity of money. The doit must have been common in the early part of the reign of James VI. The kirk-session of Perth (16th April 1582) 'ordains James Sym to give the witch in the tolbooth 8 doits in the day' for subsistence.

**DOLA'BRA**, a rude ancient hatchet. They are represented on the columns of Trajan and Antoninus, and abound in all museums. When made of flint, which was their earliest and rudest form, they are usually called *celts* (q. v.).

**DO'LCÉ**, an Italian term in music, meaning softly and with tenderness.

**DO'LCI**, Carlo or Carlino, a celebrated painter of the Florentine school, was born at Florence in 1616. He received his first instructions in art from Jacopo Vignali, a pupil of Roselli, and a remarkably skilful teacher. After an uneventful life spent entirely in his native city, D. died January 17, 1686. His works, which consist chiefly of madonnas and saints, exhibit the character attributed to him. The faces are full of a pleasing and tender softness, which, however, is often carried so far as to rob them of all character. D.'s drawing is generally correct, his colouring exquisitely delicate and transparent, and in the nicety and laborious care of his finish he approaches the most characteristic examples of the Dutch school. His works are numerous, and scattered over all Europe. Besides his madonnas, the most famous are his 'St Cecilia,' 'Christ Blessing the Bread and Wine,' 'Herodias with the Head of John the Baptist,' and 'Christ on the Mount of Olives.'

**DOLE** (Lat. *dolus*, guile), in Scotland, the amount of conscious guilt or evil intention which is necessary to make a legal crime. A person incapable of consent is also incapable of dole—*doli incapax*, as it is technically called. The corresponding phrase in England is *felonious intent*.

**DÔLE**, a well-built town of France, in the department of Jura, 28 miles south-east of Dijon. It is delightfully situated on a vineyard slope rising from the right bank of the river Doubs, and the environs are tastefully laid out in gardens and promenades. The principal building is an immense cathedral, named, in honour of the Virgin, *Nôtre Dame*. The chief manufactures of D. are hosiery, tiles, pottery, chemical products, and beer; there are also iron-smelting furnaces, flour-mills, and some trade in corn, wine, wood, marble, and iron. Pop. 7759. D. is the *Dola Sequanorum* of the Romans, of whose presence the ruins of two aqueducts, an amphitheatre, several temples, and the 'street' or road which passed from Lyon through D. to the Rhine, still give indications. There are also the remains of a castle built by Frederick Barbarossa in the 12th century. D. is likewise memorable for having sustained several sieges.

**DO'LE-FISH** seems to be that fish which fishermen employed in the north seas do of custom receive for their allowance, 35 Hen. VIII. c. 7.

**DOLES AT FUNERALS**; these are of great antiquity. St Chrysostom speaks of them as being given to procure rest to the soul of the deceased. On this ground, as well as on the score of general benevolence, the practice of making gifts to the poor at funerals was common until comparatively recent times; for it was continued, sometimes on a munificent scale, long after the custom of praying for the dead had been abandoned on the introduction of reformed doctrines. Nichols, in his *History of Leicestershire*, speaking of Strathern in Framland Hundred, observes of this usage: 'In 1790, there were 432 inhabitants, the number taken by the last person who carried about bread, which was given for *dole* at a funeral; a custom formerly common throughout this part of England, though now fallen much into disuse. The practice was sometimes to bequeath it by will; but, whether so specified or not, the ceremony was seldom omitted. On such occasions, a small loaf was sent to every person, without any distinction of age or circumstances, and not to receive it was a mark of particular disrespect.' These doles, whether in money or in articles of food and ale, were at one time common not only in England, but in Wales, Ireland, and Scotland; and the custom may be said to have represented, in a simple state of society, that form of benevolence which, in the present day, consists of bequests to hospitals and other public charities. By some writers, the custom of making doles at funerals is traced to the sin-offering of the Hebrews. See Brand's *Popular Antiquities*, edited by Ellis.

**DOLGE'LLEY** ('dale of hazels'), the capital of Merioneth, North Wales, near the centre of the county, and the largest town in it, is situated on the banks of the Wnion, 208 miles north-west by west of London. It lies in a rich and picturesque valley, at the foot of Cader Idris, and during the summer months is much frequented by English and foreign tourists. It has manufactures of coarse woollens and flannels; its Welsh Tweed is in great repute and demand throughout the kingdom; lamb and kid skins are tanned and dressed; and in the vicinity there are fulling-mills and bleach-greens. Pop. (1861) 2050. Here, in 1404, Owen Glendwr held a parliament, and signed a treaty of alliance with Charles king of France.

**DO'LICHOS**, a genus of plants of the natural order *Leguminosæ*, sub-order *Papilionaceæ*, closely allied to *Phaseolus* (see Kidney Bean), and chiefly distinguished by the extension of the base of the standard so as to embrace the wings of the corolla at their base. The genus includes a considerable number of species, some of them shrubby, some annual, and some perennial herbaceous plants. Some of them have beautiful flowers, and some of the herbaceous species are cultivated on account of their seeds, which afford a kind of pulse; or of their young pods, which, like those of the Kidney Bean, are boiled for the table. Among these are *D. Lablab*, a native of India and Egypt (which has been made the type of a separate genus, *Lablab*); *D. Nankinicus* (or *Lablab Nankinicus*), a Chinese species; *D. Lubia*, a native of Egypt; *D. sesquipedalis*, a native of America; *D. Soya* or *Soja hispida* (the Soy Bean), *D. Catiang*, and *D. uniflorus* (Horse Gram), natives of India; *D. sphaerospermus* (Calavana or Black-eyed Pea), a native of the West Indies. In the climate of Britain, even the most hardy kinds require the aid of a little artificial heat, and they are reckoned inferior to other kinds of pulse or garden vegetables of easier cultivation. The well-known Chinese sauce or ketchup called Soy (q. v.) is made from the Soy Bean. Allied to D. is the genus *Canavalia*, to which belong the Sword Beans of India. *C. gladiata*, the commonly cultivated species, has pods two feet long. Another allied genus is *Psophocarpus*. The seeds of *P. tetragonolobus*, formerly *D. tetragonolobus*, are used in the Mauritius as peas are in Britain; and its pods and tuberous roots are common Indian esculents. Some species of *Pachyrhizus*, also an allied genus, are remarkable for their tuberous roots, as *P. angulatus* (formerly *D. bulbosus*), a native of India, now cultivated in South America and other warm countries, which produces pleasant turnip-like tubers; and *P. trilobus*, which has tubers two feet long and nearly cylindrical, much used as a boiled vegetable in China and Cochin-China.

**DOLL**, an imitative baby used as a toy by girls. The word doll is of doubtful derivation; possibly from *idol;* in French, the name is *poupée;* in German, *puppe*, from Lat. *pupa*, a girl, a doll. The use of dolls dates from the most remote times, and is common in all countries, barbarous as well as civilised, because it springs from that love of nursing and fondling infants which is implanted by nature in the female character. Precisely as a child in a princely mansion in England fondles a finely dressed doll worth a guinea, so does the child of an African or Esquimaux take delight in a piece of wood or bone carved rudely in the form of a baby—in fact, girls in the humbler ranks may sometimes be seen hugging and talking to a bit of stick decorated with a few rags, as if it were a live child. This is not the place to discuss this curious psychological phenomenon; it is enough to say that the love of dolls is a perfectly legitimate feeling, and its exercise helps to cultivate not only tender affections, but taste as regards the making and management of children's dresses. Accordingly, the keeping of a doll becomes a part of the home-education of girls; and is recognised to be so by the universality of the practice.

As in the case of most other Toys (q. v.), dolls were at one time imported into Great Britain chiefly from the Netherlands; and hence not an unusual name for a doll was a Flanders baby. These old Flemish or Dutch dolls were made of wood, with neatly formed faces and flashy dresses, the cheaper kinds having slender wooden legs. Latterly, there have been great improvements in the making of dolls, and in England it has assumed the character of a manufacture; but there are still large importations from the countries on the Rhine, France, and Switzerland. In these continental countries, women and children are mostly engaged in the manufacture. Some carve the heads and bodies, others paint the faces and necks, others prepare legs and arms, and a different class cut out, sew, and put on the dresses. These operations are seldom executed in one manufactory. Usually, dealers buy the fragments so far prepared by villagers, and get them put together in a wholesale way. As the time employed in the preparatory processes is scarcely of any marketable value, the prices of fragments are most insignificant. Hence, as regards all the cheap kinds, with painted faces and ringlets, dolls can be imported at a cost below that at which they could be executed by hand-labour in England. When, however, we come to dolls of a superior kind, with moulded wax or composition faces, arms, and feet, glass-eyes, stuffed bodies, flaxen ringlets, and gauze dresses, the English, by their machinery and capital, carry off the trade. In London, in 1861, there were twenty-three doll-makers, of whom one made them from gutta-percha. In this as in other trades, there is an economic division of labour; for example, there are dolls' head-makers, dolls' leg and arm makers, doll sewers, doll stuffers, dolls' wig-makers, dolls' eye-makers, and doll dressers. For some dresses, remnants of calico, gauze, silk, and other materials are procured from shops; but for fashionably dressed dolls, much in demand, it is necessary to buy goods on a large scale. The extent to which dolls' glass-eyes are manufactured appears surprising. Some years ago, in evidence before a committee of the House of Commons, a glass-manufacturer at Birmingham stated that he had received, at one time, an order for £500 worth of dolls' eyes. The cheaper dolls' eyes are simply small hollow glass-beads, made of white enamel, and coloured with black or blue, but without any attempt at variety or effect; while those eyes of a higher quality have a ring of colour to represent the iris. The introduction of wires and mechanism to make the eyes move or wink at pleasure, and also to cause the doll to utter the sounds 'papa' and 'mamma,' have been highly appreciated steps in advance, with a corresponding rise in prices. It is stated in the experience of the trade, that since Victoria came to the throne, blue eyes for dolls have been in the ascendant in England; but that black eyes find the best market on the continent, especially for Spanish dolls. Black dolls are made for export to America, where they are in request by girls of negro parentage, and the introduction of gutta-percha is favourable for this branch of the trade. Composition-heads are usually made of *papier-mâché*, cast in a mould, and waxed and painted to represent the features.

One of the most attractive stalls at the Great Exhibition in 1851, was that which contained the dolls of Madame Montanari, a London manufacturer. Referring to this stall, the Jury Report said: 'It consists of a series of dolls, representing all ages, from infancy to womanhood, arranged in several family groups, with suitable and elegant model furniture. These dolls have the hair, eyelashes, and eyelids separately inserted in the wax, and are, in other respects, modelled with lifelike truthfulness. Much skill is also evinced in the variety of expression which is given to these figures, in regard to the ages and stations which they are intended to represent.' Some of those dolls were sold at five guineas undressed; and at a greatly increased price when richly attired. The same exhibition shewed how much skill is now exercised in making rag-dolls, in which almost every part is formed of textile materials.

**DO'LLAR** is the name of a coin, and the unit in the monetary system, of the United States. The origin of the name deserves notice. *Dollar* is a variety of the Ger. *thaler*, Low Ger. *dahler*, Dan. *daler;* and the word came to signify a coin thus: About the end of the 15th c., the Counts of Schlick coined the silver extracted from their mines at Joachims-thal (Joachim's Valley) into ounce-pieces, which received the name of Joachims-thaler—the Ger. adjective from the name of the place ('Joachims-dalers,' as it were). These coins gained such a reputation, that they became a kind of pattern; and others of the same kind, though made in other places, took the name, only dropping the first part of the word for shortness. The American dollar is taken from the old Spanish dollar or piastre, and is only slightly less. It was formerly only of silver; but since the influx of Californian gold (1849), a great issue of gold dollar-pieces has taken place. The basis of the monetary system of the United States is silver, and since 1837 the silver dollar is required to contain 412½ troy grains, or 26·4246 Fr. grammes, the fineness of which is fixed at $\frac{9}{10}$, i. e., $\frac{1}{10}$ of it is alloy. In the standard silver of Great Britain $\frac{1}{12}$ is alloy. The United States dollar is generally estimated in exchange at 4*s.* 2*d.* sterling. Besides dollars, there are coined in silver, *half-dollars, quarter-dollars, dimes* ($\frac{1}{10}$ dol.), *half-dimes* ($\frac{1}{20}$ dol.), and three-cent pieces. With regard to these, it was enacted in 1853 that the weight of the half-dollar shall be 192 grains, and that of the others proportional to this; and that such silver coins shall be legal tenders for all sums not exceeding five dollars. Accounts are kept in dollars and cents, or hundredths of a dollar, which are written thus: $13·78—thirteen dollars and seventy-eight cents. The standard gold of the United States is of the same fineness as the silver—namely, $\frac{9}{10}$; and of this are coined double eagles, eagles, half-eagles, and quarter-eagles, of 20, 10, 5, and 2½ dollars, besides three-dollar and one-dollar pieces. The dollar or thaler in Germany has various values. That of Prussia, which is most current, is equivalent to 3*s.* sterling.

**DO'LLAR**, a village in Clackmannanshire, on the right bank of the Devon, ten miles east-north-east of Stirling. It lies in a plain under the Ochills (q. v.). Coal and iron occur in the vicinity. D. is noted for its academy, founded in 1818 under the will of Captain M'Nab, a native of the parish, who bequeathed £80,000 for the purpose. The academy was incorporated by act of parliament in 1847, and has a Principal and 14 teachers in the classics, arts, modern languages, &c. The minister and kirk-session of D. were the original patrons and governors, but in 1847 the trust was extended so as to include the Lord-lieutenant, Vice-lieutenant, Convener and Sheriff of the county, the Principal of the University of Edinburgh, county gentlemen, two members of the Presbytery of Stirling, and two representatives appointed by the parliamentary electors of Dollar. Pop. (1861) 1776. The principal industrial feature of D. are its many famous bleacheries on the banks of the Devon. A mile north of D. are the fine ruins of Castle Campbell, in a wild romantic situation, on the top of a high almost insulated rock, in a hollow in the bosom of the Ochills, amid mountain rivulets and thick bosky woods, and only accessible by a narrow isthmus. It long belonged to the Argyle family. John Knox is said to have resided in the castle under the protection of Archibald, fourth Earl of Argyle, who was the first Scotch noble to embrace Protestantism publicly.

**DO'LLART**, THE, a gulf of the German Ocean, at the mouth of the river Ems, between Hanover and Holland. It is about 10 miles in length by 7 in breadth, and was formed by inundations of the sea, the first of which took place in the latter half of the 13th c., and the last in the 16th century. By these watery inroads a large number of villages were submerged, and thousands of persons perished.

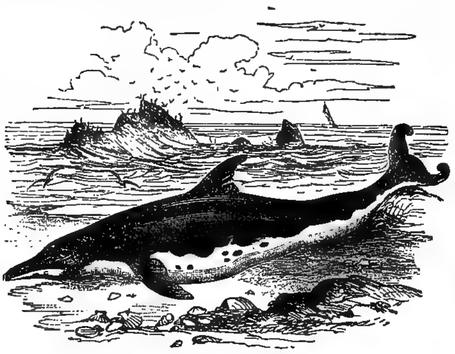
**DO'LLOND**, JOHN, a distinguished optician, inventor of the achromatic telescope, was descended from a French refugee family, and born in London, June 10, 1706. His father was an operative silk-weaver, in humble circumstances, and D. was also brought up to that occupation. Engaged at the loom all day, he devoted great part of the night to his favourite studies of mathematics, optics, and astronomy. Not content with these, he turned his attention to the most varied subjects, made himself acquainted with anatomy, and even theology, and went so far in the study of the classical languages as to translate the Greek Testament into Latin. French, German, and Italian also, he knew well. He apprenticed his eldest son, Peter, to an optician; and after the latter had established himself in business on his own account, he was joined by his father in 1752. John D. now devoted himself to the improvement of the dioptric telescope, in which he was encouraged by the most distinguished scientific men of the time. After a series of well-contrived experiments and researches, carried on for several years, he succeeded in constructing lenses that produced images without any coloured fringe. See ACHROMATIC. This was undoubtedly the greatest improvement that the telescope had received since its first invention. The Memoir (published in the *Philosophical Transactions* for 1758) in which he gave an account of his investigations, was rewarded by the council of the Royal Society with the Copley medal. In 1761, D. was elected a Fellow of the Royal Society; his death took place on the 30th of November of the same year. His two sons continued to carry on the business with great reputation and success.

**DO'LLY SHOP,** the name popularly given in London to a shop where rags and other kinds of old articles are bought, and over the door of which a black doll is usually suspended. It is understood that dolly shops are in many instances a kind of unlicensed pawnbroking concerns. For small articles, a few pence are given, on the understanding that the seller can buy them back at an advance some days after. In Edinburgh and Glasgow, shops of this kind are known as *wee pawns*, and give some concern to magistrates and police.

**DOLMEN,** the name given in France to what British archæologists call a CROMLECH (q. v.). The dolmen, properly so called, consists of *one* large unhewn stone resting on two or more unhewn stones placed erect in the earth. But the name is sometimes applied to structures where several blocks are raised upon pillars, so as to form a sort of gallery. One of the most remarkable monuments of this kind is the *Pierre Couvert*, about a mile and a half from Saumur. It is 64 feet long, about 15 feet wide, and about 6 feet high. It has four stones on each side, four on the top, and one at each end. The stone at the east end has fallen down; all the others appear to be as they were originally placed. Some of them are of great size, one on the roof measuring 24 feet in length, and more than 2 feet in thickness. All are of the sandstone of the neighbourhood. The floor is unpaved. Dolmen is believed to be a Celtic word, signifying a stone table. The monuments to which the name is given are supposed to be the sepulchres of the ancient Celts or Gauls.

**DO'LOMITE, BITTER SPAR, or MAGNE'SIAN LI'MESTONE,** a mineral consisting of Carbonate of Lime and Carbonate of Magnesia in somewhat variable proportions, sometimes nearly equal, the carbonate of lime often greatly preponderating; and usually containing also a little —sometimes nearly 20 per cent.—of carbonate of iron. It is softer than limestone; usually white; sometimes gray, yellow, or brown; and occurs compact, cellular, or porous, granular, foliated, and crystallised. Its crystals are usually rhomboidal, and its cleavage is rhomboidal. It is readily distinguished from limestone by its feeble effervescence in acids. It occasionally occurs in veins accompanied with quartz, calcareous spar, &c., but also as a rock, and forms mountain masses. It is often used as a building stone; the new Houses of Parliament are built of it. It is also burned and made into mortar, but the lime obtained from it remains much longer caustic than lime from common limestone; and if spread on land in the same quantity, impairs rather than increases the fertility of the soil, seeming to burn up the vegetation. The magnesia which such 'lime' contains, does not enter rapidly into combination with carbonic acid as lime does, and to the magnesia this injurious influence on vegetation is ascribed.—*Brown Spar* (q. v.) or *Pearl Spar* is a variety of dolomite.

**DO'LPHIN** (*Delphinus*), a genus of *Cetacea*, the type of a family, *Delphinidæ*, which is characterised by a moderate size of head—differing in this from the *Catodontidæ* or *Physeteridæ* (see CACHOLOT)—and usually by having numerous simple and conical or nearly conical teeth in both jaws, although some of the species lose those of the upper jaw at an early age. The blow-hole is single. The family *Delphinidæ* includes, along with the dolphins, porpoises, grampus, &c., many animals, which on account of their larger size are very commonly called *whales*, as the Beluga or White Whale, the Caaing Whale, the Bottlehead, &c. It contains also a few species, which inhabit, not the ocean, but tropical and subtropical rivers, as the Soosoo of the Ganges and the *Inia* of the Amazon. The true Dolphins have the snout prolonged into a rather slender beak, which is not only abruptly separated from the convex forehead, but even by a marked furrow. Both jaws are furnished with numerous equal teeth. The species are numerous, most of them recently discovered, and none of them apparently having the very wide geographical range formerly ascribed to the common D. (*D. delphis*), with which they were confounded. They are very voracious animals, and are said to prey not only on fishes, medusæ, cephalopods, &c., but even on the wounded and feeble of their own species. They live, however, in herds, which often delight the voyager in the ocean solitude by the gambols which they perform around his ship. 'They may be discerned at a great distance; as they are continually leaping from the surface of the sea, an action which, as it seems to have no obvious object, is probably the mere exuberance of animal mirth. When a shoal is seen thus frolicking at the distance of a mile or two, in a few moments, having caught sight of the ship, down they come trooping with the velocity of the wind. When arrived, they display their agility in a thousand graceful motions, now leaping with curved bodies many feet into the air, then darting through a wave with incredible velocity, leaving a slender wake of whitening foam under the water; now the thin back-fin only is exposed, cutting the surface like a knife; then the broad and muscular tail is elevated as the animal plunges perpendicularly down into the depth, or dives beneath the keel to explore the opposite side.'



Common Dolphin (*Delphinus delphis*).

The Common D. is found in the Mediterranean and in the Northern Atlantic Ocean. It is usually not more than 6 or 8 feet long, but individuals have been seen of 10 feet. The body tapers towards the tail. The tail is crescent-shaped, and about a foot in breadth. The beak is about 6 inches long. The blow-hole is crescent-shaped, with the horns directed backwards. The colour is blackish on the back, grayish on the sides, and a satiny glistening white beneath. The female D. brings forth a single young one at a time, which she suckles and nurses with great care. Although an inhabitant of the ocean, the D. emits a peculiar murmuring or suppressed lowing cry. The flesh of the D. was formerly considered a delicacy, and sailors still regard the capture of one as a happy event.

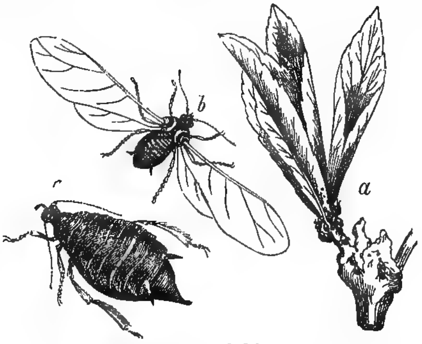
From the form of its beak, the D. receives from the French the names of *Bec d'Oie* (Goose-beak) and *Oie de Mer* (Goose of the Sea). It was very differently regarded and designated by the ancient Greeks: it was their *Hieros Ichthys* (sacred fish), was invested with many fabulous attributes, and was the subject of many mythological legends. It was supposed to be peculiarly friendly to men. It was sacred to Apollo, who was worshipped at Delphi with dolphins for his symbols. The figure of the D. (see accompanying illustration) appears on many ancient coins and medals: it is said to have been borne on the shield of Ulysses; it early appeared on the shield of some of the princes of France, and gave its name to one of the fairest of the French provinces, from which the heir-apparent of the French throne came to be styled the Dauphin. It is not easy to account for the high regard in which the D. was anciently held; nor is it altogether easy to explain the very general transference of its name in modern times to the coryphene, a very different creature, remarkable for those changes of colour in its dying moments which poets have delighted to celebrate.

Dolphin.

Of the other species of D. one only occurs, and that but rarely, in the British seas, the Bottle-nosed D. (*D. Tursio*), which is said sometimes to attain a length of 24 feet. It appears to belong to the northern parts of the world.

Dolphins not unfrequently enter the mouths of rivers. A dolphin of the Arctic Ocean (*D. leucas*) ascends into the fresh water of the Obi, to prey upon the ascending fishes of various kinds.

**DOLPHIN**, Black (*Aphis Fabæ*), a species of *Aphis* (q. v.), or plant-louse, which infests the bean, and often does considerable injury to crops, sucking the juices of the plants and preventing the development of flower-buds. It is of a dull, black, or dark-green colour, the young spotted with silvery white. The first that appear are all wingless, but by and by winged individuals are produced, and the pest spreads with great rapidity. It is in the succulent tops of the plants that the aphides first appear, and a common practice of gardeners is to remove the tops in which they are observed.



Black Dolphin:
*a*, a colony; *b*, a winged insect, magnified; *c*, a wingless female, magnified.

**DOM**, or **DON** (from Lat. *dominus*, lord). This title was originally assumed by the popes, from whom it descended, in France at least, to bishops and other dignitaries, and finally to monks. In Portugal, the title *dom* is confined to the sovereign and his family. The Spanish *don* was originally confined to the nobility, but is now bestowed by courtesy as indiscriminately as the English *Mr* or *gentleman*. The feminine *doña* is, in like manner, given to ladies.

**DO'M-BOC**, or **DOO'M-BOOK** (book of dooms or sentences, *liber judicialis*), the code of laws compiled by King Alfred, chiefly from the West-Saxon collection of his own ancestor Ina, but comprising also many portions of the Kentish collection of Ethelbert, with the supplements of his successors, and of the Mercian laws of Offa. 'Ina's collection,' says Dr Pauli, 'was the only one received entire into the Codex, which was chiefly applicable to the condition of the West Saxons. A few articles were admitted here and there from the Kentish and Mercian laws, but research into this matter is not possible, as Offa's book is lost.' Alfred made few if any original laws, but contented himself with restoring, renovating, and improving those which he found already in existence. The West-Saxon dialect had become a written language earlier than any of the Teutonic dialects of the continent; and as the power of the clergy in Saxon England was of a more limited kind than elsewhere, the laws of England, up to the period of the Norman Conquest, were administered in the vernacular speech of the people. Alfred's peculiarly Christian character is strongly impressed on his code, which begins with extracts from the Bible, 'The Lord spake all these words, saying, I am the Lord thy God.' Then follow the ten commandments, the part of the Mosaic law relating to criminal offences, and passages from the New Testament, including the golden rule. Yet it should be observed, that these extracts prove not the *ecclesiastical*, but only the *scriptural* character of the *Dom-boc*. The code was ratified by the Witan, as Alfred expressly informs us. In addition to Dr Pauli's life of Alfred, now published in two English translations, the reader is referred, for information on this subject, to Thorpe's Introduction to Alfred's Laws, in the *Ancient Laws and Institutes of England*, i. p. 58.

**DOMBROW'SKI** (properly Dąbrowski), Jan Henryk, a distinguished Polish general, was born 29th August 1755, at Pierszowice, in the district of Cracow. He entered the service of the Elector of Saxony in 1770; but in 1792, on the first symptoms of the insurrection in Poland, proceeded to Warsaw. He took part in the Polish campaigns against Russia and Prussia, and exhibited such remarkable military talent, that on the termination of hostilities, Suwarrow offered him employment in the Russian service, and Prussia made him a similar offer. Both were refused, and D. went to France, where, in 1796, he was commissioned by the Directory to form a Polish Legion among his exiled countrymen, of which he was appointed commander. The legion brilliantly distinguished itself in the Italian campaign. While in Rome, the admirable discipline which D. preserved among his troops, raised him so high in the estimation of the Senate, that it presented him with the standards which his great countryman Sobieski had taken from the Turks, when he compelled them to raise the siege of Vienna, and which he had sent to the church of San Loretto. In the campaign of 1799—1800, D. gave splendid proofs of his courage. After the peace of Amiens, D. became a general of division in the service of the Cisalpine Republic; and after the battle of Jena, along with Wybicki, he was ordered by Napoleon (1806) to summon his countrymen to arms. His entrance into Warsaw, at the head of twelve Polish divisions, resembled a classical 'triumph.' At Dirschau and Friedland, he won fresh laurels. In the fatal Russian campaign of 1812, he commanded one of the three divisions of the fifth *corps d'armée*, and at the passage of the Beresina, saved from destruction the relics of Poniatowski's corps. In 1813, at the head of his Poles, he took an honourable part in the battles of Teltow, Grossbeeren, Jüterbogk, and Leipsic. After the fall of Napoleon, D. returned to Poland, and in 1815 was appointed by the Emperor Alexander a general of cavalry and Polish senator; but in the following year he withdrew from public employment to his estate in the duchy of Posen. He died 6th June 1818.

**DOME** (Ital. *duomo*). Though often used synonymously with Cupola (q. v.), a dome, in the stricter sense which it has obtained in the languages of Northern Europe, signifies the external part of the spherical or polygonal roof, of which the cupola (*cupo*, or cup) is the internal part. In Italian usage, however, it has a wider signification than even the first, being used to denote the cathedral or chief church of a town, *the house* (domus) *par excellence*, or house of God. The cause of the name of the building being thus applied to the form of the roof which covered it, arose from the fact, that the chief churches of Italy were at one period almost universally so roofed. In tracing the historical origin of the dome, we are usually in the habit of regarding it as originating with the architecture of the Eastern Empire, because it was at Constantinople and in the Byzantine provinces that it was first employed in ecclesiastical structures. But it was the Romans who, in reality, were the inventors of the dome, as of all the other applications of the semicircular arch. Of their success in applying it to large buildings, we have abundant proof in the ancient domes still to be seen in Rome and its neighbourhood. The dome of the Pantheon is still probably the most magnificent dome in existence, and others of smaller size are to be seen in the temples of Bacchus, Vesta, Romulus, Hercules, &c. 'From Rome it went to Constantinople, and from the same source, also, came the few insignificant attempts at domes in the Western Empire.'—Fergusson's *Handbook of Architecture*, ii. 943. The external form of the dome of the church of St Sophia at Constantinople, which became the typical Christian structure of the kind, will be seen in the illustration appended to BYZANTINE ARCHITECTURE. See PANTHEON. The dome of San Vitale, at Ravenna (q. v.), is said to be still more ancient than that of San Sophia, and is a very remarkable structure of the same class. On the church of St Marco, at Venice, there are no less than five domes, the centre one, as is usual, being much larger than the others. The interior of these domes is covered with Mosaic (q. v.). So far from being peculiar to the few churches we have mentioned, domes occur in the churches of almost every town along the western shore of the Adriatic, and form, in fact, the chief architectural feature of this side of Italy. The construction of domes in modern times was revived in Rome, by the building of that of Our Lady of Loretto in 1507. But the three most celebrated modern domes are those of St Peter's (q. v.), at Rome, of St Paul's (q. v.) in London, and of the Pantheon (q. v.) in Paris. A very complete article on domes, which has been condensed in the *Penny Cyclopædia*, will be found in the *Encyclopédie Méthodique*, under 'Architecture.'

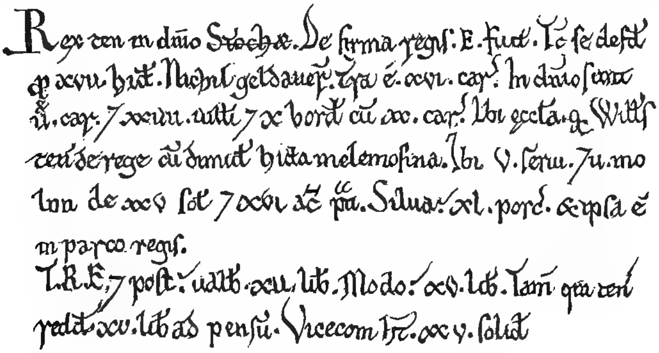
**DOMENICHI'NO**, or **DOMENI'CO**, ZAMPIERI, a celebrated painter of the Bolognese school, was born in Bologna, 1581. He began his studies under D. Calvaert, and completed them under the Caracci. During the whole of his career, D. had much to suffer from the jealousy of rivals, who are not free from the suspicion of having caused his death by poison, 1641. His frescoes are distinguished by correctness of design, soft delicacy, and freshness of colour; the heads of his figures, in particular, are remarkable for expressive force. The master-piece of D., the 'Communion of St Jerome' (in the Vatican), though suggested by Ag. Caracci's, is a sublime production. The 'Life of the Blessed Virgin,' and the 'Cure of the Demoniac Boy,' are of exquisite beauty. Out of Italy, the Museum of the Louvre possesses the largest number of D.'s works.

**DO'MESDAY BOOK**, or **DOO'MSDAY BOOK**, the name of one of the oldest and most valuable records of England, containing the results of a statistical survey of that country made by William the Conqueror, and completed in the year 1086. The origin of the name—which seems to have been given to other records of the same kind—is somewhat uncertain; but it has obvious reference to the supreme authority of the book in doom or judgment on the matters contained in it. It was anciently known by several other names, such as the *Liber de Wintonia*, or Book of Winchester; and the *Rotulus Wintoniæ*, or Roll of Winchester, because it was at one time preserved in the royal treasury in that city; the *Liber Regis*, or the King's Book; the *Scriptura Thesauri Regis*, or Record of the King's Treasury (where it was long kept, together with the king's seal, under three locks and keys); the *Liber Censualis Angliæ*, or Rate-book of England.

The way in which the survey was made will be best described in the words of the contemporary writer in the Anglo-Saxon Chronicle. After relating how, in the year 1085, England was threatened with invasion from Denmark and Flanders, and how King William prepared for its defence by laying waste the sea-shores, and by raising the largest army that had ever been seen in the island, 'billeting the soldiers upon his subjects, every man according to the land which he possessed,' the annalist goes on to say that at midwinter, when the king was at Gloucester, 'he had a great consultation, and spoke very deeply with his witan [i. e., great council or parliament] concerning this land, how it was held, and what were its tenantry. He then sent his men all over England, into every shire, and caused them to ascertain how many hundred hydes of land it contained, and what lands the king had in it, what cattle there were in the several counties, and how much revenue he ought to get yearly from each. He also caused them to write down how much land belonged to his archbishops, to his bishops, his abbots, and his earls, and —that I may be brief—what property every inhabitant of all England possessed in land or in cattle, and how much money this was worth. So very straitly did he cause the survey to be made, that there was not a single hyde, nor a yardland of ground, nor—it is shameful to say what he thought no shame to do—was there an ox, or a cow, or a pig passed by, and that was not set down in the accounts, and then all these writings were brought to him.'

The survey was made by commissioners called the King's Justiciaries, who seem to have had the help of the chief men of every shire. By a sworn assize or jury of the sheriffs, lords of manors, presbyters of churches, reeves [i. e., grieves or overseers] of hundreds, bailiffs, and six villeins [i. e., tenants at will] of every village, they made inquest as to the name of the place; who held it in the time of King Edward (1041—1066); who was its present possessor; how many hydes there were in the manor; how many ploughgates in demesne [i. e., reserved in the lord's own hand]; how many homagers or vassals; how many villeins; how many cottars; how many serfs; what freemen; how many tenants in socage [i. e., tenants by hereditary right]; how much wood; how much meadow and pasture; what mills and fish-ponds; how much had been added or taken away; what was the gross value in King Edward's time; what was the present value; and how much each free-man or soc-man has or had. Of all this there was to be a threefold return or valuation: 1. As the land was held in King Edward's days; 2. As it had been given by King William; 3. As it stood at the time when the survey was made; and the jurors were to say further whether the value could now be raised.

The returns thus gathered in the several shires, and their hundreds and other subdivisions, were arranged and digested in the record which is now called the Great or Exchequer Domesday. The enumeration of the cattle and swine, which so moved the indignation of the Anglo-Saxon chronicler, was omitted from the record, doubtless because the live-stock was altering every month and year, so that an account of its numbers in any one year could not be of permanent importance; but that the enumeration was made, is proved by the records called Little Domesday and the Exon Domesday. These are believed to be transcripts of the original rolls or returns made by the Conqueror's commissioners for the counties of Essex, Norfolk, Suffolk, Wilts, Dorset, Somerset, Devon, and Cornwall; and they set forth the number of horses, oxen, sheep, goats, and pigs, together with some other details left out in the compilation of the Great Domesday.



Specimen of Domesday Book:

The reading is as follows:

Rex tenet in Dominio Stochæ. De firma Regis Edwardi fuit. Tunc se defendebat pro 17 Hidis. Nichil geldaverunt. Terra est 16 Carucatæ. In Dominio sunt 2æ Carucatæ & 24 Villani and 10 Bordarij cum 20 Carucis. Ibi Eclesia quam Willelmus tenet de Rege cum dimidia Hida in Elemosina. Ibi 5 Servi & 2 Molini de 25 sol. & 16 Acræ Prati. Silva 40 Porcorum & ipsa est in parco Regis.

Tempore Regis Edwardi & post valebat 12 lib. Modo 15 lib. Tamen qui tenet reddit 15 lib. ad pensum. Vicecomes habet 25 solid.

The mere statement which has been made of its contents, is enough to shew the immense value of Domesday Book for all purposes of inquiry into the ancient condition of England. 'It will ever,' says Dr Lappenberg, 'be found an inexhaustible source of information respecting the Anglo-Saxon and Norman constitutions, particularly the rights and revenues of the kings and their vassals, the relations of cities and towns, statistic accounts of various kinds, families and their landed members, together with innumerable matters highly interesting to inquiring posterity, but unnoticed by the chroniclers of those times, either as too well known or as worthless. An intimate acquaintance with Domesday should supply the basis of every historical account of England, particularly of its special history during the middle age.' No other country of Europe can shew such a work. It was fit, therefore, that it should have been the first great English record published at the national cost. It appeared in 1783 in two folios, being printed with types cast for the purpose, so as to represent the contractions of the original manuscript, and having been ten years in passing through the press. In 1816, two supplementary volumes were published, the one containing an excellent general introduction, by Sir Henry Ellis of the British Museum, with indices of the names of places and of the tenants in chief mentioned in the work; the other containing four other records of the same nature: 1. The Exon Domesday, already mentioned; 2. The Inquisitio Eliensis, a record closely resembling the Exeter Domesday, containing the survey of the lands of the monastery of Ely, in the counties of Cambridge, Hertford, Essex, Norfolk, Suffolk, and Huntingdon; 3. The Winton Domesday, containing two surveys of the city of Winchester, one made between 1107 and 1128, the other in 1148; and, 4. The Boldon Book, a survey of the possessions of the see of Durham, made in 1183. This last work is especially valuable, as partially supplying a deficiency in the survey for Domesday Book, which did not extend to the counties of Durham, Northumberland, Westmoreland, and Cumberland, either, it would seem, because they had been lately laid waste by the Conqueror, or because his dominion was not fully established in them. A new and better edition of the Boldon Book was issued in 1852 by the Surtees Society, which, in 1857, printed *Bishop Hatfield's Survey*, another record of the possessions of the see of Durham, compiled between 1345 and 1381. A new and enlarged edition of

Sir Henry Ellis's *General Introduction to Domesday Book*, was published in 1833, in 2 vols. 8vo. In 1861, a fac-simile copy of that part of Domesday Book which relates to Cornwall, was published by the Ordnance Survey, as an example of what can be done by the new process of engraving called photozincography. 'The process,' says Sir Henry James, in his report of the Topographical Department of the War Office, presented to parliament in 1861, 'is so extremely simple and inexpensive, that the sale of a few copies of the fac-simile at 4*s*. 6*d*. a copy, will cover the entire expense of the publication.' Should this experiment succeed, it is the intention of the government to publish the whole of Domesday Book, county by county, in the same way.

**DOMESTIC ANIMALS** are those which, in order to turn them to his use, man has tamed or reduced in a greater or less measure from their natural wildness, and which he makes the objects of his care, and in a living state his property. Many animals are useful to man, which he has never thus appropriated. Such are the deer and other game which the hunter pursues, and fishes generally, whether of the sea, lake, or river. Man has not yet found it possible to domesticate them, or has not found it necessary or desirable to do so. Individuals, indeed, of some species may have been domesticated, and become very tame, but these are exceptional instances. In general, those only are called domestic animals which have existed from one generation to another in a state of domestication. Of almost all of them, domesticated races exist, considerably different from any that are now found in a state of nature; the peculiar circumstances in which they are placed by domestication exercising a modifying influence, like that of cultivation in plants. Domestic animals mostly belong to the classes of Mammals and Birds. Of mammals, those which have been domesticated are exclusively of the common quadruped form, and mostly herbivorous. The greatest number, and these among the most important, belong to the order of Ruminants; some of them being valuable for their flesh, their milk, their hair or wool, their hide, &c., or as beasts of burden and of draught, some even on all these accounts. To this order belong the ox, buffalo, and yak, the sheep, the goat, the reindeer, the camel, and the llama and alpaca. Of other herbivorous quadrupeds, the most important are the horse and ass, the elephant and the hog. Of the elephant, however, although for many ages it has been much employed for various purposes in India, no domesticated race exists; the individuals which man reduces to his service, being still taken as at first from among the wild denizens of the forest. Domesticated races exist of two comparatively unimportant quadrupeds of the order of Rodents, the rabbit and the cavy or Guinea-pig.—Of carnivorous quadrupeds, there are only two which have been generally and thoroughly domesticated, the dog and the cat. The uses to which these animals are destined are very different from those in order to which herbivorous quadrupeds are kept in a domestic state. Analogous to one of the uses of the dog is that to which the cheetah or hunting-leopard is applied by some of the princes of India, but like the elephant, it is only individually domesticated. The same remark may be made concerning some other animals—the otter, the civet, &c.—which in different countries are tamed or kept in confinement to meet certain purposes for which man finds it convenient to employ them. The domestication of the ferret is rather more complete.—Of birds, the most important domestic species belong to the gallinaceous order, and to the family *Anatidæ* among web-footed birds. To the former belong the common domestic fowl, the turkey, the peacock, the Guinea-fowl, &c.; to the latter, the goose, duck, &c. Of other birds, none can be said to be truly domesticated, except, perhaps, one or two species of song-birds, particularly the canary. The birds used in falconry are domesticated only in the same sense as the cheetah; but it is not uninteresting to observe that man has been able to make both birds and beasts of prey his servants.—Reptiles are quite capable of being tamed, and in some countries some of them are occasionally kept in houses for killing flies, or even for killing mice and rats; but none of them can be enumerated among domestic animals. Nor, perhaps, can any species of fish be so regarded, although artificial ponds have long been in use, and some species of fresh-water fish are to a certain extent the objects of care and of a kind of culture on the part of man.—In the lower divisions of the animal kingdom, only a few species ever receive such culture, or in their living state are claimed by man as his property. All these belong to the class of insects—viz., two or three species of bee, two or three species of silk-worm moth, and two or three species of cochineal insect. These may perhaps more fitly be described as *cultivated* than as *domesticated.*

Many animals not yet domesticated, might probably be added with advantage to the number of domestic animals. Adaptation to particular climates and situations might probably be found to recommend species allied to those in which great part of the wealth of mankind has long consisted, and from which still more of it has been derived. It is not impossible, also, that as the waste places of the world become peopled, animals already becoming scarce, may be advantageously domesticated on account of their fur or other products for which they are now pursued by the hunter.—The principal domestic animals, however, of the present day, have been domestic animals, and highly valued as such, from time immemorial. We have no record of the domestication of the ox, the horse, the camel, the dog, &c. Even the llama and alpaca, although known only to the inhabitants of the Andes and adjacent regions, were found in a state of domestication there when South America was first visited by Europeans, and their subjection to man is probably to be referred to the earliest periods of Peruvian civilisation. The limitation of some domestic animals to particular countries and climates—of which we have notable instances in the camel of the Asiatic deserts, the reindeer of the arctic regions, the yak of the steep and snow-clad Himalaya, the buffalo of tropical marshes, and the South American quadrupeds just mentioned—forbid us to suppose that all the important domestic animals were domesticated by the same people and at the same period, or that they have all spread in a state of domestication from a common centre or source. Yet there are many circumstances which point to the same Asiatic region as that in which the greater number of them were first domesticated, which is commonly regarded as the cradle of the arts and sciences, and even of the human race.

**DOMESTIC ARCHITECTURE.** The external forms and internal arrangements of the domestic abodes of a people are far more influenced by their manners, habits, and occupations, and by the climate in which they live, than their ecclesiastical edifices and public buildings; and there is, consequently, no department of architecture which is so varied and national as domestic architecture. But not only are the circumstances of each country different in this respect—the same is the case with every department of each country, with every town in each department, with every street in each town; and a domestic architecture which fulfils its object, will not only adapt itself to the necessities, but will make the best, in point of artistic effect, of the specialties of every case with which it is called upon to deal. The circumstances of families, and even the tastes and fancies of individuals, are legitimate subjects of consideration in domestic architecture. To attempt to give to domestic architecture the beauty of uniformity, is consequently to mistake both its object and the source from which its charm is derived. When attained at all, uniformity is attained not in accordance with, but in defiance of, the utilitarian objects of domestic architecture. The results of this artistic falsehood may be seen in the monotonous and meaningless streets and squares that have been built in all our principal towns during the last eighty years. The legitimate charm of domestic architecture, because the only one which can arise from the complete fulfilment of its object, is the charm of variety. It is the charm which our ancestors sought during the whole of the great architectural period of the middle ages, and which our architects, who in this, as in so many other respects, are returning to their principles, are now beginning to cultivate. But here, as in all similar cases, it must be borne in mind that, in general, it is the principle alone that can be revived, and that the details by which it was carried out can be legitimately copied only in the exceptional cases in which circumstances and the objects to be attained remain unchanged. The position of an Englishman in the 19th differs in many respects from that of an Englishman in the 14th c.; and to construct for the former a house in all respects resembling that which was constructed for the latter, would be to commit an error the same in kind as if we had sought for either of them a model dwelling in Pompeii or Canton.

An account of the forms of English houses from the 12th c. downwards, will be found in Parker's *Glossary of Architecture.* Apart from our own earlier examples, the forms of domestic architecture most suggestive for present use in this country, are those which are to be found in such wonderful beauty and variety in almost all of the older continental towns of the north of Europe. It was from the domestic architecture of France and the Netherlands that that of Scotland, at its best period, was mainly borrowed; and if we wish to improve it now, we can scarcely do better than revert to its original source.

**DOMESTIC MANAGEMENT**, financially considered, may be defined as the art of making a given income go the furthest possible in procuring for a family the means of living—the word living being understood in its wider and higher sense. It being assumed, as a fundamental maxim, that the outlay shall be within the income, the leading object of the art is, rightly to apportion the outlay among the different requisites. How this is best to be done, can be discovered only by large experience; and if a young housekeeper were to begin her career without some indications of the path she should follow, she must fall into serious mistakes, occasioning loss and discomfort. Not that any amount of previous instruction, whether written or oral, can give the skill of experience; but attention to some of the more important maxims may help to avert very serious errors while the lessons of experience are being learned. By way of outline charts for this rather intricate navigation, we give here four schemes of household expenditure, based upon experience, and adapted to some of the more extensive classes of the British community, prefacing the schemes with a few general and miscellaneous observations.

It is a very safe rule, that the best quality of food is the cheapest in the end; 'it goes further'—i. e., it gives more nourishment; but those who require to practise economy may, by going to market themselves, purchase good meat at a cheaper rate than they would if they sent for it, from reasons known to experienced buyers, such as the pieces they select not being called prime cuts, not being so well shaped, &c., which in no way takes from the wholesomeness of the article. Again, good cooking renders things more digestible and nourishing; bad cooking is absolute waste, to say nothing of the injury it does to the stomach. How meat is rendered tender by boiling or broiling, without having its nutritive qualities extracted, is described in the articles BOILING and BROILING. For the time necessary for roasting, baking, stewing, and frying, good instructions are given in the very useful works, *The Dictionary of Daily Wants,* and Mrs Beeton's *Book of Household Management,* where not only the mode of cooking, but the actual cost of each dish, is given.

Some books on housekeeping recommend that Coal should be bought when cheap, and that Groceries should be purchased in large quantities; but this is open to the objections, that coal occupies a larger space than can be spared in small houses; that many articles of grocery waste in quantity or deteriorate in quality by keeping, as sugar, which loses weight, and tea, which loses aroma; and that both coal and grocery in masses, are apt to be wasted by servants, children, and thoughtless persons, from the circumstance of having large quantities to go to. Groceries may be *bought* cheaper in this way, and it is only personal experience that can decide in every case as to their being *really* cheaper. Candles and soap are the chief things that certainly improve by keeping. Candles should be hung up, if dips; but moulds should be stored in boxes, and covered and kept in a dry place. Soap bought in bars, in as dry a state as possible, should be cut in lumps, six to the bar, and laid on shelves, to harden slowly.

A thorough knowledge of the art of choosing material for Clothing, and making and cleaning articles of apparel, is also highly necessary, and, like good marketing for food, can only be acquired by practice. Many things must be considered in this kind of purchase; the evenness of the threads in cotton and linen fabrics, softness of texture, freedom from what is called 'dress.' In printed goods, the same rule is to be observed as to evenness of weaving, in addition to which, those kinds should be selected that have the pattern printed through, so as to shew on the wrong side, and of a lilac or dark-blue colour, as being the best for washing. Flannel goods should be chosen for their regular make, good width, and softness; and flannel articles should be made larger and longer than necessary, to allow for shrinking when washed. Good patterns for making from should be obtained, well-fitting and appropriate dress lasting longer, and looking better than what is put together in an inconsiderate, slovenly manner; a clever needlewoman, like a clever cook, is the most truly economical one. The same remarks apply to furniture-chintzes and linens for sheetings, &c. Articles chosen for glare and show, without regard to their being in keeping with the general style of the room or house, of a flimsy, irregular, or ill-printed make, must certainly turn out unsatisfactory and wasteful.

The accompanying scales relate to prices in London and other large English towns, and reckoned on the allowance of a loaf and a half of bread (weighing four pounds to the loaf) for each individual. Young children consume less bread than full-grown persons, but they require more milk and sugar; therefore the scale can be equalised according to circumstances. Puddings and vegetable food for the children must also influence the amount for butcher's meat. It is supposed in these scales that the husband dines at home; if he dines in the city, or elsewhere, a reduction must be made in the butcher's, baker's, grocer's, and publican's bills. Half a pound of butter, and half a pound of sugar, are the usual weekly allowances for each person. If the children are too young to be educated, the money allowed in the following scales should be saved till they are older.

SCALE FOR AN INCOME OF £300 PER ANNUM, FOR A FAMILY CONSISTING OF HUSBAND, WIFE, THREE CHILDREN, A GENERAL SERVANT, AND A NURSE-GIRL.

| | £ | s. | d. |
|---|---|---|---|
| Rent, taxes, and rates, . . . . . | 45 | 0 | 0 |
| Wages (£10 and £6), . . . . . . | 16 | 0 | 0 |
| Butcher, at 14s. weekly, . . . . . . | 36 | 8 | 0 |
| Baker (10½ quarterns at 8½d.; 1½ quartern of flour at 9d.—flour being dearer than bread), say 8s. 6d. weekly, . . . . . . . . | 22 | 2 | 0 |
| Grocer (tea, 2s.; parlour sugar, 7d.; children's and servants', 2s. 1d.; parlour butter, 1s. 4d.; children's, 8d.; servants', 1s. 2d.; cooking, 3½d.; spice, 4½d.; cheese, 1s.; bacon, 1s.; rice and pudding material, 1s.; candles, 1s. 6d.), 13s. weekly, | 33 | 16 | 0 |
| Vegetables and fruit, . . . . . . | 7 | 0 | 0 |
| Milk (three pints daily, at 4d. a quart), 3s. 6d. weekly, | 9 | 2 | 0 |
| Beer (1 quart daily for parlour at 5d.; servants' allowance, 1s. each), 4s. 11d. weekly, . . | 12 | 15 | 8 |
| Fuel, . . . . . . . . | 10 | 0 | 0 |
| Washing (all done at home), soap, soda, mangling, | 4 | 0 | 0 |
| Clothing, . . . . . . . | 30 | 0 | 0 |
| Church and charities, . . . . . | 3 | 0 | 0 |
| Library and books, . . . . . | 2 | 0 | 0 |
| Fire insurance, . . . . . . . | 0 | 15 | 0 |
| Insurance on life, . . . . . . | 8 | 0 | 0 |
| Education, . . . . . . . . | 15 | 0 | 0 |
| Replenishing furniture, crockery, glass, &c., . | 4 | 10 | 0 |
| Travelling (change of air), . . . . | 10 | 0 | 0 |
| Doctor, . . . . . . . . . | 10 | 0 | 0 |
| Income-tax, . . . . . . . | 11 | 5 | 0 |
| Omnibus, postage, and sundries, . . . | 9 | 6 | 4 |
| | £300 | 0 | 0 |

SCALE FOR AN INCOME OF £200 PER ANNUM, FOR A FAMILY CONSISTING OF HUSBAND, WIFE, THREE CHILDREN, AND A SERVANT.

| | £ | s. | d. |
|---|---|---|---|
| Rent and taxes, &c., . . . . . . . | 32 | 0 | 0 |
| Wages, . . . . . . . . | 5 | 0 | 0 |
| Butcher, at 9s. 6d. weekly, . . . . . | 24 | 14 | 0 |
| Baker (9 loaves at 8½d.; flour, 9d.), 7s. 1½d. weekly, | 18 | 10 | 6 |
| Grocer, 8s. weekly, . . . . . . | 20 | 16 | 0 |
| Milk (quart daily at 4d.), 2s. 4d. weekly, . . | 6 | 1 | 4 |
| Beer (quart daily at 5d.), 2s. 11d. weekly, . . | 7 | 11 | 8 |
| Vegetables and fruit, . . . . . . | 5 | 10 | 0 |
| Fuel, . . . . . . . . . | 8 | 0 | 0 |
| Washing (soap, starch, soda, &c.), . . . | 3 | 10 | 0 |
| Clothing, . . . . . . . . | 15 | 10 | 0 |
| Church and charities, . . . . . | 2 | 0 | 0 |
| Library and books, . . . . . . | 1 | 10 | 0 |
| Fire insurance, . . . . . . . | 0 | 9 | 6 |
| Insurance on life, . . . . . . | 6 | 0 | 0 |
| Income-tax (at 9d. in the pound), . . . | 7 | 10 | 0 |
| Education, . . . . . . . . | 10 | 10 | 0 |
| Doctor, . . . . . . . . . | 6 | 0 | 0 |
| Replenishing linen and household goods, . . | 3 | 15 | 0 |
| Travelling to sea-side, . . . . . | 6 | 10 | 0 |
| Omnibus, postage, sundries, . . . . | 8 | 12 | 0 |
| | £200 | 0 | 0 |

SCALE FOR AN INCOME OF £100 PER ANNUM, FOR A FAMILY CONSISTING OF HUSBAND, WIFE, AND THREE CHILDREN.

[Rooms only should be rented, unless a lodger could be found, who would help to pay the rent of a cottage.]

| | £ | s. | d. |
|---|---|---|---|
| Rent, 5s. weekly, . . . . . . . | 13 | 0 | 0 |
| Butcher, 5s. weekly, . . . . . . | 13 | 0 | 0 |
| Baker (7½ loaves at 7d.; flour, 8d.), weekly, 5s. 0½d., | 13 | 2 | 2 |
| Grocer, 4s. weekly, . . . . . . | 10 | 8 | 0 |
| Milk, 1s. weekly, . . . . . . | 2 | 12 | 0 |
| Vegetables, 1s. 8d. weekly, . . . . | 4 | 6 | 8 |
| Beer (occasional), . . . . . . | 3 | 0 | 0 |
| Fuel, . . . . . . . . . | 6 | 0 | 0 |
| Washing (soap, starch, &c.), . . . . | 2 | 0 | 0 |
| Clothing, . . . . . . . . | 12 | 10 | 0 |
| Doctor, or sick fund, . . . . . . | 4 | 0 | 0 |
| Education, . . . . . . . . | 5 | 0 | 0 |
| Life insurance, . . . . . . . | 2 | 0 | 0 |
| Fire insurance, . . . . . . . | 0 | 4 | 6 |
| Charities, . . . . . . . . | 0 | 5 | 6 |
| Holiday excursions, . . . . . . | 3 | 0 | 0 |
| Replenishing household goods, . . . | 1 | 13 | 4 |
| Books, papers, and periodicals, . . . | 1 | 0 | 0 |
| Postage and sundries, . . . . . . | 2 | 17 | 10 |
| | £100 | 0 | 0 |

SCALE FOR AN INCOME OF £52 PER ANNUM, FOR A FAMILY CONSISTING OF HUSBAND, WIFE, AND THREE CHILDREN.

| | £ | s. | d. |
|---|---|---|---|
| Rent of rooms, 3s. 6s. weekly, . . . | 9 | 2 | 0 |
| Baker (7½ loaves at 7d.; flour, 8d.), 5s. 0½d. weekly, | 13 | 2 | 2 |
| Butcher, 1s. 6d. weekly, . . . . . | 3 | 18 | 0 |
| Milk, 7d. weekly, . . . . . . | 1 | 10 | 4 |
| Tea (quarter lb. at 3s. 8d.), 11d. weekly, . . | 2 | 7 | 8 |
| Sugar (1½ lb. at 5d.), 7½d. weekly, . . . | 1 | 12 | 6 |
| Rice, treacle, and pearl-barley, . . . | 1 | 6 | 0 |
| Butter (½ lb. at 1s. 2d.; dripping, 1 lb. at 3d.), 10d. weekly, . . . . . . . | 2 | 3 | 4 |
| Candles, average 6d. weekly, . . . . | 1 | 6 | 0 |
| Mustard, salt, and spice, . . . . . | 0 | 4 | 0 |
| Vegetables, 1s. 6d. weekly, . . . . | 3 | 18 | 0 |
| Coal and wood, 1s. 3d. weekly, . . . . | 3 | 5 | 0 |
| Soap and soda, . . . . . . | 1 | 10 | 0 |
| Schooling, 3d. weekly, . . . . . | 0 | 13 | 0 |
| Clothing fund, . . . . . . | 3 | 10 | 0 |
| Sick fund, . . . . . . . . | 0 | 10 | 0 |
| Holiday excursions, . . . . . . | 1 | 0 | 0 |
| Postage, books, and sundries, . . . | 1 | 2 | 0 |
| | £52 | 0 | 0 |

[This income could be improved by having lodgers, who would help to pay the rent, and also if a plot of kitchen-garden ground could be obtained.]

These scales may be regulated to suit families of greater or smaller numbers than those mentioned here. For rural places in England, and for Scotland generally, considerable modifications must be made.

**DO'MICILE**, a man's legal place of abode, or the place which the law will hold to be his residence. In determining questions of domicile, so often surrounded by difficulties, the law endeavours to follow the facts of each case, and, consequently, the legal as well as the natural view of the matter is expressed in that definition of a domicile in the code which says, 'every man has his domicile where he has placed his hearth and centred his fortunes, whence he goes not forth without an occasion, from which, when he is absent, he is said to be abroad, and to which, when he returns, he is said to cease to be abroad.'—Cod. 10, tit. 40, s. 7. Even in Rome, questions of domicile were not without importance, for the empire was divided for purposes of domestic government, and the inhabitant of one province was not subject to the magistrates of another. But it was in modern times, when Europe was divided into many independent kingdoms, and America was formed out of states having different local customs and laws, that the law of domicile assumed its full importance. It now constitutes one of the most difficult branches of private International Law (q. v.). The following are its most general rules: 1. The place of birth is the original domicile of every one, provided that, at the time of his birth, it was the domicile of his parents; but if his parents were then on a visit or on a journey, the home of the parents will be the domicile of birth, nativity, or origin (*domicilium originis*). 2. If the child is illegitimate, it follows the domicile of its mother. 3. The domicile originally obtained continues till a new one is acquired; unless it be lost by non-residence, under the provisions of a statute, as is the case with paupers, for the purposes of parish relief in Scotland. 4. Minors are generally deemed incapable of changing their domicile of their own accord, but it may be changed by a change in the domicile of the parents, which it follows. 5. If the father dies, his last domicile is that of his widow and children. 6. A wife follows the domicile of her husband. 7. The place where a man lives, if there be no ground for entertaining an opposite presumption, is his domicile. 8. If a person of full age, having a right to change his domicile, takes up his abode in a new place, with the acknowledged intention of remaining permanently fixed there (*animo manendi*), that place immediately becomes, and that which he has quitted ceases to be, his domicile. Questions as to what amounts to intention, or what circumstances constitute sufficient proof of intention of remaining, or quitting a place of residence, are amongst the most difficult in the law of domicile. Most persons who are resident abroad have a sort of floating notion that, in certain conceivable circumstances, they would return to their native country, and to these vague feelings they give expression in a manner more or less vague. At what point are we to draw the line between their retention and their abandonment of a legal 'intention to return.' The expressions of Lord Chancellor Cottenham, in the case of Munro *v.* Munro (10th August 1840, Robertson's *Appeal Cases*, i. p. 492), contain nearly all that can be laid down as general doctrine on this subject. 'In questions of domicile, it is, I conceive, one of the established principles, not peculiar to England, that the domicile of origin must prevail until the party has not only acquired another, but has manifested and carried into execution an intention of abandoning his former domicile, and acquiring another as his sole domicile. Such, after the fullest consideration of the authorities, was the principle laid down by Lord Alvanley in Sommerville *v.* Sommerville (5 Vesy, 787), and from which I see no reason for dissenting.' It is impossible, in our limits, to enumerate the effects of the law of domicile. Generally, it may be stated that it regulates the succession to personal or movable property, which is said to follow the person, and must be distributed after death according to the law of the country of which the deceased died a domiciled citizen. Heritable or real property, again, descends in accordance with the law of the land in which it is situated (*lex rei sitæ*). As to the effect of a domicile of citation in Scotland in actions of divorce, see DIVORCE, MARRIAGE.

**DO'MINANT**, in Music, the fifth above the tonic: the ruling or governing tone of the key. Ancient writers called the dominant the *quinta toni*, from its being the next in importance to the tonic. The dominant chord is always a major chord, the third being the *subsemitonium modi*, or leading note, which always rises a semitone to the tonic. The dominant seventh is the major chord with the flat seventh above the dominant, and is the same in major and minor keys. The rules for the treatment of the dominant seventh, and for the chord of the ninth on the dominant, apply to all other chords of the seventh or ninth, which arise from the other degrees of the scale. The dominant seventh is a most important chord in modulation. The resolution of the dominant seventh is always into the chord of the tonic, when not interrupted. The dominant as a key is the nearest in relation to the tonic. Modulation into the key of the dominant is so frequent in composition, that its form may be said to be stereotyped. The subdominant, or under-dominant, stands next in importance to the dominant, and has its place on the fourth above the tonic, or, which is the same, on the fifth below. The chord of the subdominant is major or minor, according to the mode of the key. The chords on all other degrees of the scale, being either minor or diminished, give greater importance to the major chords of the tonic, dominant, and subdominant, in which chords all the notes of the scale are found, while the combination of these chords, giving the most perfect impression of a key, may account for their being of such importance in harmony.

**DOMINANT TE'NEMENT.** See SERVITUDE.

**DOMI'NGO**, SAN, a maritime city of Hayti, stands on the south-east coast, at the mouth of the Ozama, in lat. 18° 29′ N., and long. 69° 57′ W. It is the oldest settlement of European origin in America, having been founded in 1494 by Bartolommeo Columbus. The population numbers about 15,000; and the principal buildings are churches, including a cathedral, convents, hospitals, colleges, barracks, an arsenal and a light-house. Its name has been extended in various senses. It has been applied to the whole island, practically superseding the 'Hispaniola' of Columbus; and also to the French or west section of Hayti, as distinguished from the Spanish or east division, in which the place is situated. From it, also, the last-mentioned portion has derived its epithet of 'Dominican' as a separate territory. See HAYTI, and DOMINICAN REPUBLIC.

**DO'MINIC**, ST. See DOMINICANS.

**DOMINICA** or **DOMINIQUE**, a British West India Island, lies in lat. 15° 18′ N., and long. 61° 24′ W., containing about 290 square miles, and about 24,000 inhabitants. It is of volcanic origin, hot and sulphureous springs still attesting the fact. It is the loftiest of the Lesser Antilles, attaining, at one point, an elevation of 5314 feet, and nearly one-half of the surface consists of precipitous mountains and deep ravines. Where capable of cultivation, the soil is fertile; and, even on apparently inaccessible sites, the emancipated negroes have successfully established provision grounds. The principal productions are sugar, coffee, cocoa, cotton, tobacco, molasses, rum, copper ore, and cabinet-woods. In 1849 and 1857 respectively, the exports amounted to £48,523 and £98,046—the increase in eight years thus being more than 100 per cent.; and the corresponding imports were £50,584 and £60,911. In 1857, there were entered 307 vessels and 9274 tons, while there were cleared 302 vessels and 8754 tons. In 1857, again, the revenue was £14,526, and the expenditure, including the maintenance of the poor, was £13,098; while, in 1849, the returns had given £8877, and £10,539. The legislation of 1857 appropriated £700 for the purpose of affording aid, under statutory regulations, to schools of every denomination—a liberality which, while accepted by Protestants, whether of the Church of England or of dissenting bodies, does not appear to have been appreciated by the Roman Catholic priesthood. The abolition of slavery, independently of inferences to be drawn from correlative statistics, is admitted by all parties to have worked well in Dominica. In 1839, the planters at a public meeting acknowledged, 'with feelings of unmixed gratification, the peaceable and quiet disposition evinced by the labourers, as a body, since their entire emancipation;' and, in 1852, the lieutenant-governor officially adverted to the prosperity and contentment of the same class. It is even said that most of the 20 members of assembly are men of colour. The temperature, according to season and altitude, ranges from 88° F. down to chilliness; and even in the dry months, from February to August, rain frequently falls. D. was discovered by Columbus, on his second voyage, in 1493, on a Sunday (whence its name Dominica, i. e., the Lord's Day), being then thinly inhabited by Caribs. From the commencement of the 17th c. to the middle of the 18th, it may be described as having been a neutral island; but in 1759 it was captured by England, and permanently ceded by France in 1763. In 1802 it again came into the possession of France, but was finally handed over to England in 1814.

**DOMI'NICAL LETTER**, or **SUNDAY LETTER**, is one of the seven letters A, B, C, D, E, F, G, used in almanacs, &c., to mark the Sundays throughout the year. The first seven days of the year being marked in their order by the above letters in their order, then the following seven, and all consecutive sets of seven days to the end of the year, are similarly marked; so that the 1st, 8th, 15th, 22d, &c. days of the year are all marked by A; and the 2d, 9th, 16th, 23d, &c., by B; and so on. The days being thus marked, it is evident that on whatever day the first Sunday of the year falls, the letter which marks it will mark all the other Sundays in the year, as the number of the letters and of the days in the week is the same.

As the common year consists of 52 weeks and one day over, the dominical letters go backwards one day every common year. If the dominical letter of a common year be G, F will be the dominical letter for the next year. As a leap-year consists of 52 weeks and two days, the letters go backwards two days every leap-year. If in the beginning of a leap-year the dominical letter be G, E will be the dominical letter for the next year. This extraordinary retrocession, however, is made to take place at the intercalary day (the 29th February) by the artifice of marking it by the same letter as the day preceding it, and thus the next Sunday is marked by the letter preceding that which marked the Sundays before the intercalary day. Suppose the 28th February in a leap-year to be a Sunday, and marked by F, it is evident that the dominical letter for the rest of the year will be E. As every fourth year is a leap-year, and the letters are seven in number, it is clear that the same order of letters must return in four times seven, or 28 years, which would, but for the leap-years, recur in seven years, and hence the Solar Cycle (q. v.). The dominical letters were first introduced into the calendar by the early Christians, to displace the nundinal letters in the Roman calendar. They are of use as a means of discovering on what day of the week any day of the month falls in a given year. See EASTER. Rules and tables for finding them are given in prayer-books, breviaries, &c., as well as in works on Dates (q. v.).

**DOMINICAN REPU'BLIC**, a short-lived phase of the Spanish or east section of Hayti (q. v.), has already, in May 1861, closed an existence begun, at the earliest, in 1843, by returning to its original allegiance. Spain, in 1697, surrendered to France, by the treaty of Ryswick, the west part of the island, retaining the remainder down to 1795. In the year last mentioned, however, the Spanish portion became nominally French. In 1814—the west having vindicated its independence—France formally relinquished, in favour of Spain, all claim to the east. In 1822, the colony, in imitation of the continental possessions, threw off the yoke of the mother-country, to link itself, more or less closely, with its African neighbours. But, in or about 1843, it assumed a separate standing as the Dominican Republic. Finally, at the date above mentioned, after a troubled life of seventeen or eighteen years, it has exchanged its constituted anarchy for the somewhat despotic protection of its former masters. It covers far more than half the area of the island; but, greatly inferior in proportion of population, it contains only about 200,000 inhabitants.

**DOMI'NICANS**, an order of preaching friars in the Roman Catholic Church (*Fratres prædicatores*), founded at Toulouse in 1215 by Dominic (Domingo) de Guzman. Dominic was born at Calahorra, in Old Castile, in 1170. He studied theology at Palencia, and in 1199 became canon and archdeacon of Osma in Castile. In 1205, along with his superior, Diego de Azebes, Bishop of Osma, he began to itinerate through the south of France, for the purpose of converting the 'heretical' Albigenses; and convinced that the ignorance of the people and the worldliness of the clergy were great helps to the progress of heresy, he instituted the order which bears his name, for the express purpose of preaching and the cure of souls. Dominic, however, found it impossible to convert the Albigenses by this method, and therefore had recourse to another. In 1208, at the instigation of Dominic, the pope proclaimed a crusade against these 'heretics;' the barons of France were summoned to take part in it, and headed by De Montfort, committed horrible slaughter on these unfortunate people. The order of the D. was confirmed by Innocent III. and Honorius III. in 1216. The members followed the rule of St Augustine, somewhat modified; their dress was a white garment, resembling that of the Carthusians, with a black cloak and pointed cap of the same colour. In 1220 they took the vow of poverty. Dominic died at Bologna in 1221, and was canonised by Gregory IX. in 1233. He is said to have been ordinarily not a cruel or unfeeling man, but his religious passions were so vehement, that they entirely dried up the milk of human kindness in his heart, and his conduct towards heretics was merciless in the extreme. As early as 1206, he founded an order of Dominican nuns, which, after 1218, when the first convent was established at Rome, spread far and wide. These nuns followed the same rule as the friars, and were solemnly pledged to habits of industry. A *third* Dominican order (the Knights of Christ) was established in 1224, and confirmed in 1279. It was originally a company of knights and nobles who had leagued themselves together for the suppression of 'heresy' by force of arms, but after the death of its founder, the order was changed into that of the *Penitents of St Dominic.* The members of this branch of the D. were also called the Tertiary Dominicans. They were not bound by any vows, but their special duties were to observe particular fasts and devotions, and to execute great ecclesiastical judgments. They retained all their civic and domestic privileges. There were also *female* Penitents of St Dominic, a few of whom, however, betook themselves to a conventual life, and became nuns. These few were chiefly in Italy; the most famous was St Catharine of Siena. The glory of apostolic poverty, which encircled the D., the privileges which they possessed—especially of preaching and hearing confession—and the circumstance that as early as 1230, only fifteen years after the foundation of their order, they secured a chair of theology in the great university of Paris, all helped to rapidly increase their numbers and influence. Within *six* years after their establishment, they had spread to England through one Gilbert du Fresney, and founded a monastery at Oxford. 'The monks,' writes the contemporary annalist, Matthew Paris, himself a Benedictine, 'did not, in three or four hundred years, ascend to such a height of greatness as the friars, minors and preachers, within twenty-four years after they began to build their first house in England.' Their progress was scarcely less rapid in Scotland, where they found a munificent patron in King Alexander II., who is said to have met St Dominic at Paris about the year 1217. In Britain, the Dominicans were called the *Black Friars.* In France, they received the name of Jacobins, from the Rue St Jacques (Lat. *Jacobus*) in Paris, where they first established themselves. Their monasteries arose throughout all Christendom, and were even to be seen on the shores of Asia, Africa, and subsequently America. Their monarchical constitution, which bound all the branches and congregations of the order under one grand head (*magister ordinis*), insured their progress and the co-operation of their efforts to secure influence in church and state. Through their preaching and proselytising, it is undeniable that they exercised, at the time of the foundation of their order, and for a considerable time after, an influence alike extensive and beneficial. They have produced several great scholars and men of genius, such as Albertus Magnus; Thomas Aquinas, the normal theologian of the Roman Catholic Church; and Raymund de Pennaforte. They have, however, acquired a black reputation in history in connection with the Inquisition (q. v.), in which they were the chief agents. After 1425, when they obtained permission to accept endowments, they in some measure refrained from begging, and engaged themselves more with politics and theology. Their great rivals were the *Franciscans* (q. v.), and the mutual animosity of the two orders was strongly exhibited in the disputes of the Thomists and Scotists. These two orders divided between them the honour of controlling the church, and often the Catholic states of Christendom, until the rise of the Jesuits in the 16th c., who gradually drove both from the schools and the court, when the D. were compelled to return to their original vocation. Their power was, however, again revived to a certain extent in 1620, when the censorship of books was conferred on the Master of the Vatican at Rome, who must always be a Dominican. In the 18th c., the order of D. possessed 1000 monasteries and convents, divided into 45 provinces, besides 12 separate congregations or sects. At present, the order flourishes only in Italy, France, Hungary, Switzerland, and America. The Dominican nuns, who are not numerous, have convents in Italy, France, Belgium, Hungary, Bavaria, and America.

Dominican, or Black Friar.

**DO'MINIS**, Marcus Antonius de, an ecclesiastic whose career was both singular and checkered. He was born in 1566 at Arba, on the coast of Dalmatia, and educated, first at Loretto, and subsequently at Padua, where he greatly distinguished himself both by his ability and the varied character of his studies. While at Padua, he taught mathematics, physics, and eloquence. Having completed his theological curriculum, he was, after some time, appointed Bishop of Segni, and two years later, Archbishop of Spalatro, in which capacity, however, he quarrelled with the pope, and having, moreover, exhibited certain Protestant leanings, he found it expedient to resign his post. In 1616, he came to England, where he was hospitably received. King James appointed him Dean of Windsor; and while holding this office, he wrote his *De Republica Ecclesiastica*, a work in which he endeavoured to shew that the pope had no supremacy over other bishops, but was only *primus inter pares*. D. published one or two other productions between 1617 and 1618; but finding Anglicanism far from satisfactory, a revulsion of feeling occurred, and D. once more looked and longed for the unity of the Catholic Church. The motives that induced him to return to the Roman Catholic Church are not known. Most writers consider that he was actuated by avarice and ambition, but a critical appreciation of his character would lead us to doubt this harsh judgment. He was, it has been supposed, desirous of discovering a church broad enough to form the basis of a universal Christianity. Men holding such opinions are always misunderstood, and so D., even after his return to Rome, was still suspected of heresy. In consequence, he was imprisoned in the castle of St Angelo, where he died, September 1624. Being subsequently condemned as a heretic, his body was raised from its grave, and burned.

While at Padua, D. wrote his *De Radiis Visus et Lucis in Vitris Perspectivis et Iride* (Venice, 1611). He was the first to point out that in the phenomenon of the rainbow, the light undergoes, in each rain-drop, two refractions and an intermediate reflection.

**DOMI'NIUM**, a Roman law-term, which has been received into the technical language of most of the legal systems of Europe. It may be described as a full legal right in and to an object—as the right from which alone legal possession could flow, but which actual possession alone could never confer, unless such possession had endured for the period of legal prescription. The right to possess is thus distinguished from the right arising from possession, which is the usufruct. Ownership or dominium may be either absolute—that is to say, it may include the beneficial interest in the subject—or it may be bare ownership, consisting in some limited power over it at the time, or some ultimate right to it at a future time. Dominium must not be confounded with Imperium (q. v.), which has a totally different signification.

**DO'MINO**, the name formerly given to the garb worn in winter by priests while officiating in cold edifices. It is now used to signify a masquerade costume, consisting of an ample cloak or mantle with wide sleeves. See Masquerade.

**DOMINOS**, the name of a game, usually played with 28 oblong, flat pieces of ivory or bone, &c., each of which bears two numbers marked by points from nought to six. The party wins who has first played out his tablets, or, if this has been found impossible, who has the fewest points on the tablets still remaining. The game of dominos has been attempted to be traced back to the Greeks and Hebrews, and also to the Chinese. So much is certain, that it was introduced about the beginning of the 18th c. from Italy into France, where it immediately became popular in the larger towns. From Paris it spread to Germany, where, as in France, it is now played in every coffee-house. The Café de l'Opera, in Paris, long boasted of assembling the most expert players; an honour, however, which was warmly contested by the establishments of Rouen and Poitiers.

**DO'MINUS**, the Latin word by which we commonly render lord, but which more properly signifies master, as opposed to slave (*servus*). Aurelianus is said to have been the first emperor who adopted dominus as a title of honour on his medals. though it had long been made use of in conversation and in correspondence in that sense, as by Pliny in addressing Trajan. In legal phraseology, the *dominus litis* is the person really interested in the issue of an action, though not necessarily the pursuer.

**DOMITIA'NUS**, T. Flavius, emperor of Rome from 81 to 96 A.D., was the son of Vespasian, and younger brother of Titus, whom he succeeded on the throne. The earlier years of his reign were on the whole advantageously occupied for the public benefit. Many good laws were passed, the provinces carefully governed, and justice rigidly administered. As he grew older, however, his ambition, his jealousy, and his pride, wounded by the failure of his campaigns against the Dacians and the Marcomanni, in 87 A.D., began to instigate him to the most atrocious cruelties. By murder or banishment, he deprived Rome of nearly every citizen conspicuous for talent, learning, or wealth. To win the army, he greatly increased the pay of the soldiers, and secured the favour of the people by prodigal largesses and gladiatorial shows and games, in which he sometimes took part in person. His cruelties became at length so intolerable, that a conspiracy—encouraged, if not organised—by his wife Domitia, whom he had doomed to death, was formed against him, and the tyrant fell under the dagger of the assassin, 18th September 96 A.D.

**DO'MO D'O'SSOLA**, a charming little town in the extreme north of Piedmont, at the foot of the Simplon, near the right bank of the Tosa, which flows into Lago Maggiore. Its general aspect is peculiarly Italian. It has some trade and several handsome buildings, but is chiefly noteworthy as being a starting-point for tourists who wish to make excursions up the southern valleys of the Alps. The chief places of interest in the vicinity are the Val Anzasca, the Val Vigezzo, and the Falls of the Tosa. From D. D. the Simplon can be ascended in seven hours. Pop. 2200.

**DON** (anc. *Ta'nais*), a river of Russia, has its source in a small lake in the government of Tula, in lat. about 53° 45′ N., and long. 38° 10′ E. It flows at first in a south-eastern direction through the governments of Tula, Riazan, Tambov, and Woronetz, and after winding south-west through the country of the Don Cossacks, it advances to its embouchure in the Sea of Azov, which it enters by three mouths, only one of which is navigable. The Don receives 80 affluents, of which the principal are the Sosna and the Donetz on the right, and on the left the Khoper, the Medvieditza, the Sal, and the Manitch. Its total length is about 900 miles. Its course is obstructed by frequent sand-banks, which, when the water is low, render navigation impossible to any but flat-bottomed boats. From April to June, however, during which months it overflows its banks, and forms unwholesome swamps on either side, it is navigable as high as Zadonsk, 600 miles from its mouth. The Don is connected by a canal with the Volga, and by this means the produce and manufactures of the interior are conveyed to the southern provinces of Russia. The waters of the Don abound in fish, the traffic in which commodity is considerable, especially in its lower course.

**DON**, a river of Aberdeenshire, rising on the west border of the county in a peat-moss, 1640 feet above the sea. It runs north-east, then east, and lastly south-east, entering the sea a mile north-east of Old Aberdeen. It has a total course of 78 miles, but only 42 in a straight line, and it drains a tract of 495 square miles, chiefly composed of granite and gneiss, with a little syenite and clay-slate. In the upper part of its course, it receives some large mountain streams, but its chief tributary is the Ury, which comes 24 miles from the north-west. Near the junction of the Ury and Don is a curious conical gravel hillock, called the Bass, the subject of a prophecy by Thomas the Rhymer. The Don, at less than a mile from the sea, is crossed by the old 'Brig o' Balgownie,' of one Gothic arch. Lord Byron, while a youth, had a superstitious dread in crossing this bridge, from an old prophecy connected with it. To keep this bridge in repair, Sir Alexander Hay, in 1605, left an annuity of £2, 5*s*. 8⅔*d*., which sum has now accumulated to about £19,000, in addition to about £17,000 spent thirty years ago in the erection of a new bridge over the Don, a quarter of a mile lower down.

**DON**, or **DUN**, a river of the West Riding of Yorkshire, rising in the moors on the borders of Derbyshire and Cheshire. It runs 55 miles, first south-east to Sheffield, and then north-east by Rotherham, Doncaster, and Thorne, into the Aire, which soon afterwards unites with the Ouse. Its basin consists of Carboniferous and Permian strata. Its chief tributaries are the Rother, Dearne, and Wente. It is navigable for the last 39 miles of its course below Sheffield, by the aid of artificial canals and cuts.

**DON BENI'TO**, a town of Spain, in the province of Badajoz, 55 miles east of the city of that name. It is situated near the left bank of the Guadiana, and is in general well built, with wide and tolerably clean streets. It has several squares, the chief of which is lined with the principal structures in the town, including the town-hall, prison, and a convent; and in the centre is a public promenade. D. B. has manufactures of woollens, wine, and oil, and its proximity to the Guadiana affords it great trading facilities. Pop. about 15,000.

**DON CA'RLOS.** See Carlos.

**DON JU'AN** is a legendary and mythical personage like Dr Faustus. The two have been made the representatives of two different tendencies, both proceeding from the same principle—from the principle, namely, of unbelief and godlessness, which necessarily turns self into either a god or a beast—the principle of subjectivism, or selfishness become dominant. In Faust, expression has been given to the subjective idealism of the Germanic nations, their tendency to subtle speculation and a rationalism antagonistic to faith. In D. J. appear the practical materialism and refined sensualism of the Romanic peoples, and the tendency of blind belief in a corrupt catholicism to pass into unbelief.

Although Faust and D. J. have thus the same source and the same termination, yet, as they proceed from opposite poles, they stand in contrast to each other, and, as was natural, have found different vehicles of expression—Faust in poetry, D. J. in music. The ideal of the D. J. legend is presented in the life of a profligate who gives himself up so entirely to the gratification of sense, especially to the most powerful of all the impulses, that of love, that he acknowledges no higher consideration, and proceeds to murder the man that stands between him and his wish, fancying that in so doing he had annihilated his very existence. Partly in wanton daring, partly to allay all uneasy misgiving, he then challenges that Spirit in which he disbelieves to demonstrate to him its existence in the only way he holds valid—namely, through the senses. When this actually happens, when the Spirit proves its existence and power by animating the marble statue which he had, with daring mockery, invited as his guest, and summoning him to the final tribunal, compels him to acknowledge the supremacy of spirit, and the worthlessness of a merely sensuous, godless, and immoral existence, it is all over with him, he is crushed, and sinks into hell.

This ideal career is aptly enough localised in one of the most luxurious cities of the once world-monarchy of the Saracens—viz., Seville—and the characters wear the names of the ancient noble families of the place. The hero of the story, D. J., is described as a member of the celebrated family Tenorio, and is represented as living sometimes contemporary with Peter the Cruel, sometimes with Charles V. The chief aim of his sinful career is the seduction of the daughter of a governor of Seville, or of a nobleman of the family of the Ulloas. Being opposed by the father, he stabs him in a duel. He then forces his way into the family tomb of the murdered man, within the convent of San Francisco, causes a feast to be prepared there, and invites the statue which had been erected to his victim to be his guest. The stone guest appears at table as invited, compels D. J. to follow him, and, the measure of his sins being full, delivers him over to hell. At a later period, the legend came to be mixed up with the story of a similar profligate, Juan de Maraña, who had in like manner sold himself to the devil, but was at last converted, and died as a penitent monk in the odour of sanctity.

The genuine legend of D. J. was first put into form by Gabriel Tellez (Tirso de Molina), in *El Burlador de Sevilla y Convivado de Piedra.* This drama was transplanted to the Italian stage about 1620, and soon found its way to Paris, where numerous versions of it, among others Molière's *Festin de Pierre* (1669), made their appearance. It was brought on the English stage by Shadwell under the title of *The Libertine* (1676). In the end of the 17th c., a new Spanish version of Tellez's play was prepared by Antonio de Zamora, and brought on the stage. It is this version that forms the groundwork of the later Italian versions and of Mozart's opera. It was first put into an operatic form by Vincenzo Righini in *Il Convitato di Pietra* (1777); the text of Mozart's *Don Giovanni* was written by Lorenza da Ponte (1787). Through this famous opera the story became popular all over Europe, and has since furnished a theme for numbers of poets, playwrights, and writers of romance. A. Dumas has a drama, *Don Juan de Maranna;* Byron's *Don Juan* follows the name, and in so far the character, of the original; and Prosper Mérimée's novel, *Les Ames du Purgatoire, ou les Deux Don Juan,* is founded upon it.

**DON QUI'XOTE.** See CERVANTES.

**DONABUE**, a town of Pegu, stands on one of the main branches by which the Irawaddy enters the Bay of Bengal, lat. 17° 10′ N., and long. 95° 27′ E. It is within the delta of this grand artery of the country, and is situated 65 miles to the north-west of Rangoon, and 54 to the north-east of Bassein, the principal seaports of the newly acquired British province. It is only on historical grounds, however, that the place is worthy of notice. Here the English were repulsed with considerable loss in both the Burmese wars; first in 1825, and again in 1853.

**DONAGHADEE′**, a seaport in the north of the county of Down, on the Irish Channel, 18 miles English (14 Irish) east-north-east of Belfast, and 22 miles south-west of Portpatrick, Wigtonshire, with which it is connected by a submarine telegraph cable. It forms a crescent round the harbour, with two chief streets, one facing the sea. Its exports are cattle, grain, potatoes, &c. The embroidery of muslin was established in D. about 40 years ago, and it still (1861) maintains its pre-eminence in this branch of manufactures, which gives employment to the greater part of the female population. Pop. (1861) 2665. On the north of D. is a conical mound, 140 feet high, 480 feet in circuit at the base, and surmounted by a modern miniature castle 50 feet high, whence there is a very extensive prospect, including the Scotch coast and the Isle of Man. The Danes, in 837, are said to have destroyed a university which stood on a level a little south of where D. now is.

**DO'NALDSON**, JOHN WILLIAM, was born in London, June 10, 1811. His father, Stuart Donaldson, a wealthy merchant, was descended from an old Scotch family; his mother was daughter of J. Cundall, Esq. of Snale Green, Lancashire. He was educated first at the university of London, and afterwards at Trinity College, Cambridge. He graduated as B.A. in the year 1834, and obtained the second place in the first class of the classical tripos. The year following, he was elected Fellow. His first work was a volume, entitled *The Theatre of the Greeks,* partly original and partly compiled, which, having been carefully revised and improved in six successive editions, still holds its place as a school and college class-book. He was still resident at Cambridge, holding the office of assistant-tutor of Trinity, when he published the first edition of his *New Cratylus* (1839), a work remarkable for its research, erudition, and boldness, and as being the first attempt, on a large scale, to familiarise Englishmen with the principles of comparative philology, as established by the great scholars of Germany—Pott, Bopp, Grimm, and others. Availing himself largely, but not servilely, of the labours of these men, he developed their principles, and continued their researches, with a special application to the history, structure, and etymology of the Greek language. The third and last edition of the *New Cratylus* (1859), much altered and enlarged, is still the most important work which has been written in English upon the subject. Mr D. soon after married the daughter of Sir John Mortlock of Stapleford, and accepted the post of head-master of the grammar-school of Bury St Edmunds, having previously taken holy orders. Notwithstanding the engrossing nature of his duties as head-master, he found time to prosecute and extend his linguistic studies, embracing in their wide range Hebrew and Arabic, and most of the dialects of modern Europe. In the *Varronianus,* of which the first edition appeared in 1844, he undertook to accomplish for Latin philology what in the *New Cratylus* he had done for Greek. He dedicated the work to the Bishop of St Davids (Dr Thirlwall), in grateful recognition of the benefits derived from his Cambridge teaching. Among his other works of this period may be mentioned an edition of Pindar, of the *Antigone* of Sophocles (with a verse translation), *Maskil le Sopher* (a treatise on Hebrew grammar), and finally *Jashar,* a book written in Latin, and published at Berlin, the object of which was, by critical tests, to distinguish the fragments of the lost book of *Jashar* imbedded in the Pentateuch. This book was violently assailed by the so-called 'religious press,' which did not prevent its undaunted author from issuing a second edition.

Soon afterwards he resigned his place at Bury St Edmunds, and returned to Cambridge, where he gave a course of lectures on Latin Synonyms, and occupied himself with tuition. Here he wrote a volume entitled *Christian Orthodoxy.* Some critics vehemently disputed its right to the title. A smaller volume on Classical Scholarship followed. He had previously issued a *Greek Grammar* and a *Latin*

*Grammar* for the use of schools. These, during his residence at Cambridge, he recast and enlarged, so as to rival in profundity and copiousness any other works on the same subjects. In 1856, he was appointed one of the Classical Examiners in the university of London, an honour which he owed chiefly to the strenuous support of Mr Grote, the historian of Greece.

He was engaged in superintending the compilation of a new *Greek Lexicon*, when his health, for the first time, began to shew symptoms of failure. A tour in Germany during the summer of 1860 did not produce any change for the better. Incipient disease of the brain, the result of overwork, shewed itself first by neuralgic pains, and afterwards by more alarming symptoms. He removed to London, and died in his mother's house, after some weeks of great suffering, borne with calm and patient courage, on the 10th of February 1861. In private life, he was distinguished by kindness of heart, ready wit, unfailing vivacity, and varied conversational powers. It ought, perhaps, to be mentioned that a little work, published anonymously under the title of *Phileleutherus Anglicanus*, which made no small sensation at the time of its appearance, has been very generally attributed to Dr Donaldson.

**DONALDSON'S HOSPITAL**, an extensive establishment at Edinburgh, of the character of Christ's Hospital, London. Its founder was James Donaldson, a successful printer in Edinburgh, son of Alexander Donaldson, publisher, of whom some notice is taken in the articles Book-trade and Copyright. In 1763, Alexander started the *Edinburgh Advertiser* newspaper, which was afterwards conducted by his son James, and became a lucrative concern in his hands. Dying in 1830, James bequeathed the fortune of two generations, amounting to about £215,000, to trustees, for the endowment and erection of a hospital for the maintenance and education of poor boys and girls. The building, which occupies a commanding situation to the west of Edinburgh, was begun in 1842, and finished in 1850, is a large and beautiful quadrangular structure, in the Elizabethan style, the late W. H. Playfair being the architect. The cost of the edifice and furnishings was nearly £124,000, but as this was defrayed by the accumulated interest, the original endowment remained untouched. The hospital can accommodate 300 children—150 boys and 150 girls: at present (1861) it contains 177 children (102 boys and 75 girls) of whom 72 (45 boys and 27 girls) are deaf and dumb. Those eligible for admission are declared to be, '1st, Poor children of the name of Donaldson or Marshall, if appearing to the governors to be deserving; 2d, Such poor children as shall appear to be in the most destitute circumstances and the most deserving of admission.' None are received whose parents are able to maintain them. The children are clothed and maintained in the hospital, and taught such useful branches of a plain English education as will fit the boys for trades, and the girls for being servants. The age of admission is from six till nine, and that of leaving the hospital fourteen years. The children wear a simple uniform of modern fashion.

**DONATE'LLO** (properly, Donato di Betto Bardi), one of the restorers of the art of sculpture in Italy, was born at Florence in 1383. He belonged to the Donato family, which reckons several scholars among its members, and has given some doges to the republic of Venice. *Donatello* was a diminutive given to the artist in childhood. He received his earliest instructions from Lorenzo Bicci. His first great works in marble were the 'St Peter' and 'St Mark' in the church of St Michael in his native city. His own favourite, however, was the statue of an old man in the garb of a senator, on the steeple of the same church. It is known under the name of *Zuccone* (the Gourd or Baldhead). He died at Florence, December 13, 1466. D.'s principal works, besides those already mentioned, are—a statue of 'St George' (in marble), 'Judith bearing the Head of Holofernes' (in bronze), the 'Crucifixion' (in wood), several statues of the 'Baptist' (executed in various materials), and a grand equestrian statue (in bronze) of Erasmus Gattemelata, erected on one of the public places of Padua. He also executed a number of bas-reliefs. The whole tendency of D.'s genius was towards a reproduction of the antique; and his style, though not free from harshness and the rudeness of early art, sometimes reminds one of the glorious productions of ancient Greece.

**DONA'TION.** A donation in prospect of death, *donatio mortis causa*, differs from a gift *inter vivos*, inasmuch as it is incomplete, and revocable during the donor's life, or ambulatory, as lawyers say. It differs from a legacy, on the other hand, in that it requires no probate, for it is not a testamentary act, the donee's title proceeding directly from the donor in his lifetime. In Scotland, following the law of Rome, it is common to distinguish between donations *pure*—or those which do not take place in anticipation of death, marriage, or any other specific event—and gifts. Such donations are in reality gifts, but gifts which are not intended to be immediately delivered. It was with reference to this species of donation that the equitable arrangement called the *beneficium competentiæ* was introduced, by which the donor was allowed to retain as much as was necessary for his own subsistence before fulfilling the obligation, if he was reduced to indigence. Another implied condition of a donation by the Roman law was, that when any one who had no children made a donation of the whole or the greater part of his estate, the donation became void if he had children afterwards; the presumption being, that he would not have given his property away if he had anticipated that he was to become the father of a family. It is a general principle of law, that a donation is never presumed; but this rule suffers an exception in the case of aliment given without an agreement to pay board, which is presumed to be gratuitous unless given by one who makes a livelihood of entertaining strangers. Minors, and persons incapable of contracting, are not presumed to have been alimented gratuitously, unless their relationship to their entertainer be such as to warrant the presumption. Where the minor is possessed of an adequate separate estate, even the father may claim the expense of maintaining him, and the rule applies with greater force to all more distant relatives. Donations between man and wife (*inter virum et uxorem*) were by the Roman law, and are by the law of Scotland, revocable by the donor at any time during his or her life, *ne conjuges mutuo amore se spolient* (lest the spouses should despoil themselves from mutual love). But mutual grants for substantial considerations between the spouses are not revocable, if there be any reasonable proportion between the two. Thus, where there has been no ante-nuptial contract of marriage, the husband may provide for the wife in the event of her survivance, and the provision will be effectual in so far as it is rational. It will be revocable only *quoad excessum*. Donations in the prospect of marriage (*donationes propter nuptias*) in the Roman law were given by the husband in security of the dowry or *dos*, which he was bound to pay back to the wife or her relatives on the dissolution of the marriage. When the *dos* was returned to the wife, the donation was returned to the husband. In the law of Scotland, when donations *propter nuptias* are spoken of, we are to understand provisions made by the husband not with a view to the dissolution of the marriage, but as an equivalent for the dowry, or, as it is called in Scotland, the *tocher*.

**DO'NATISTS** were the followers of Donatus, a Numidian bishop who opposed the election of Cecilianus in 311 A.D. to the bishopric of Carthage, on the ground of the ordination having been performed by one who had been a Traditor, or traitor—that is, one who, during persecution, had given up the sacred books to the pagan authorities; and also because Cecilianus had exhibited great hostility towards the victims of the late persecution. After some time, the Council of Arles (August 1, 314 A.D.) decided against Donatus, who in a short time seceded from the Catholic Church, and formed a distinct sect, which, by 330, had as many as 172 bishops in Northern Africa. The D., like the Novatians (q. v.), went upon the principle, that the essence of the true church consisted in the purity and holiness of all its members individually, and not merely in its apostolical and Catholic foundation and doctrine. They therefore both excommunicated all lapsed and gross offenders, not receiving them again but on being re-baptized, and also held that the efficacy of the sacraments depended on the worthiness of the administrator. Driven to fanaticism by the oppression of the secular power, they not only denied to the state all right to meddle with ecclesiastical affairs, but bands of Donatist ascetics collected, attacked the imperial troops (348), and continued to devastate Mauritania and Numidia for a dozen years. In the beginning of the 5th century, they seem to have almost equalled the Catholics in number, and the eloquence of Augustine and the severities of Honorius were exercised upon the sect in vain; they continued to exist as a separate body. But by adopting a more prudent plan of proceeding, the Catholic bishops had, by the end of the 6th c., induced most of those that had left to return to the bosom of the church; and in the 7th c. the D. were extinct. Donatism is regarded by Neander (see *Dogmengeschichte*, translated into English by J. E. Ryland: Bohn, vol. ii. page 394) as a reaction against that form of Catholicism, 'which conceived the church to be an outward organism, continued by the succession of bishops, who formed the necessary medium of communication with Christ, and for partaking in the Holy Spirit and salvation.' 'Whoever is shewn to be a Christian in a right and lawful manner, is to me a Catholic,' was a saying of the D.; while the church in general, guided by Augustine, wished to let the worthy and unworthy remain mixed together, and to defer the separation to the final judgment.' Thus, while the D. had the merit of superior strictness of theory, it must be acknowledged that their views were less practical than those of their opponents.

**DONA'TUS**, ÆLIUS, a well-known grammarian and commentator, who taught grammar and rhetoric at Rome about 355 A.D., and was the instructor of St Jerome. He wrote treatises, *De Literis, Syllabis, Pedibus et Tonis, De Octo Partibus Orationis*, and *De Barbarismo, Solecismo*, &c., the best edition of which is in Lindemann's *Corpus Grammaticorum Latinorum* (vol. i.). These writings form together a pretty complete course of Latin grammar, and in the middle ages were the only text-book used in the schools, so that Donat came, in the west of Europe, to be synonymous with grammar, or with the elements of any science. *The Donat into Religion* is the title of a book by an English bishop, and there was an old French proverb, *Les diables estoient encore à leur Donat* (The devils were yet in their grammar). The Latin grammar of D. has formed the groundwork of the elementary treatises on that subject to the present day. Donatus was one of the first books on which the art of printing by means of letters cut on wooden blocks was tried, and copies of these Donatuses are reckoned among the greatest of bibliographical curiosities. The author also wrote a commentary on Terence, of which we possess only a part extending to five comedies, to be found in the edition of Terence by Kloz (2 vols., Leip. 1838).

From this D. we must distinguish a later grammarian, TIBERIUS CLAUDIUS DONATUS, from whom we have a very worthless life of Virgil, prefixed to many editions of that poet, and fragments of a commentary on the *Æneid*.

**DO'NAUWÖRTH**, a town of Bavaria, situated at the confluence of the Wernitz and the Danube, about 25 miles north-north-west of Augsburg. It is well built, in the form of an amphitheatre, round the side of a hill, and is surrounded by walls. It was formerly a free imperial city of considerable importance, but it has now sunk into an insignificant place of 3000 inhabitants. It is historically interesting, however, as the main cause of the Thirty Years' War; the severity of the punishment meted out to the inhabitants in 1607, in consequence of their adoption of the Reformed doctrines, and their assault on a Roman Catholic procession of the 'host,' having led to the formation of the Protestant League, and Catholic Union, the opponents in that long and severe struggle. It is likewise associated with the name of Marlborough, who stormed and carried the intrenched camp of the Bavarians here in 1704. Also, on the 6th October 1805, the French, under Soult, obtained a victory here over the Austrians, under Mack.

**DO'NAX**, a genus of lamellibranchiate molluscs, of the family *Tellinidæ*, with shell of two equal valves, which close perfectly, and are of a triangular form, prettily striated from the beak to the margin, the beak occupying the obtuse angle of the triangle. The species of D. are generally small. Several are found on the British coasts. The fossil species are not numerous, and belong to the eocene formation.

**DO'NCASTER**, a municipal borough in the West Riding of Yorkshire, on the right bank of the Don, on the Great North Road, 35 miles south of York. The country around is flat, but beautiful. Fine old elms line the broad and level road from the south. D. is very clean and well built. The High Street is a mile long. It has manufactures of iron, brass, sacking, linen, and agricultural machines. Its corn-market is one of the largest in the kingdom. Pop. (1861) 16,430. D. was the ancient *Danum*, and lay on the Roman road from York to Lincoln. Roman coins, urns, and a votive altar have been found here. It was the *Dona Castre* of the Saxons. The Saxon Northumbrian kings had a palace here. D. was burned by lightning in 759, and frequently ravaged by the Danes. It has long been famous for its annual races, begun in 1703, and held a mile south-east of the town in the second week of September. Colonel St Leger, in 1776, founded stakes which have been yearly run for by the best horses in England. On an eminence five miles west-south-west of D. are the ruins of Conisborough Castle, a Norman-Saxon round tower, 37 feet in diameter and 86 feet high, with walls 15 feet thick, strengthened by square buttresses reaching the whole height. The door is arrived at by an external flight of 37 steps, and within is a cylinder, 22 feet in diameter, open to the heavens.

**DO'NDRA HEAD**, the most southerly extremity of Ceylon, is in lat. 5° 55′ N., and long. 80° 38′ E. As compared with Cape Comorin, the corresponding point in the peninsula of Hindustan, it more directly faces the Indian Ocean, and lies nearer the grand thoroughfares of eastern commerce. An adjacent village of the same name numbers 900 inhabitants.

**DONEGA'L**, a seaport in the south of Donegal county, at the mouth of the Eske, on a shallow creek at the top of Donegal Bay, 11 miles north-north-east of Ballyshannon. It lies in a rich alluvial tract, surrounded on three sides by softly swelling verdant hills, behind which rise lofty picturesque mountains. Pop. (1861) 1516. D. exports corn and butter. On the river is Donegal Castle, formerly belonging to the O'Donnels of Tyrconnel. On the shore are the ruins of a Franciscan monastery, founded in 1474 by Hugh O'Donnel. Near D. is a frequented sulphureo-chalybeate spa.

**DONEGAL**, a maritime county in Ulster province, the north-westmost Irish county, and washed by the Atlantic on the north and west. Its greatest length is 85 miles; greatest breadth, 41; average, 27; area, 1865 square miles, one-third being arable, and $\frac{1}{160}$ in wood. The coast-line is 395 miles long, being indented by many deep bays and loughs, some 2 to 20 miles broad, and 15 to 25 long. Some of the coast cliffs rise from 500 to 800 feet. Of the many isles off the coast, 17 are inhabited. Except a small comparatively level tract in the east and south-east, the surface is mountainous and uneven, moory and boggy, with many small lakes, and rivers, and falls, the whole associated with endless fairy tales and traditions. The highest hill, Erigal, rises 2462 feet, and several other hills exceed 2000 feet. The mountain-ridges run north-east and south-west. The largest stream is the Foyle, running 16 miles north-east into Lough Foyle. Derg is the largest loch. D. is composed of granite, metamorphic rocks, and graywacke, with some Devonian and carboniferous limestone strata and trap. White marble occurs at Dunlewy. Except on the Foyle, the climate is moist, raw, and boisterous, from violent west and north-west winds. There are many ruins of houses and churches overwhelmed with sand. Of the Irish counties, D., in ratio to its area, has least land in cultivation and occupied in towns and woods. The soil is generally cold and poor on the primitive rocks, and light clay on the slaty. In 1858, a fifth of the county was in crop, the chief crops being oats, potatoes, turnips, barley, and flax. There are manufactures of linen, worsted stockings, worked muslins by females, and kelp. There are fisheries of cod, sole, plaice, herring, and mackerel. Trade is chiefly through Londonderry. Inaccessible retreats and abundance of turf-fuel have made D. the chief seat of illicit distillation in Ireland. D. contains 6 baronies, 8 poor-law unions, and 51 parishes. Pop. (1841) 296,448; 1851, 255,160. D. sends two members to parliament. The towns are small, the chief being Lifford, the county town; Ballyshannon, Letterkenny, Rathmelton, Donegal, and Killybegs. Industrious farmers and artisans occupy the low fertile tracts, but the people of the mountains are poor and dirty, dwelling with their pigs and cattle. Till 1612, when James I. planted Ulster with English and Scotch settlers, the south part of D. was called Tyrconnel, and belonged to the O'Donnels, who, from the 12th c., were inaugurated as Princes of Tyrconnel on Doune Rock, near Kilmacrenan. D. has many ruins and traces of forts, of 30 religious houses, castles, and of the palace of the North Irish kings on a hill near Loch Swilly. Near Derry is the coronation-stone of the ancient Irish kings. D. contains many memorials of St Columba. Warren, in 1798, captured a French fleet off Tory Isle, which contains the remains of seven churches, two stone crosses, and a round tower. St Patrick's Purgatory is on an isle in Lough Derg. Near Horn Head is a hole in the roof of a cave called M'Swiney's Gun, from which issue, at half-tide, and with a north wind, jets of water with loud explosions.

**DONGARPU'R**, a fortified town of Rajputana, in Central India, is in lat. 23° 50′ N., and long. 73° 45′ E., and is 345 miles to the north of Bombay. It is the capital of a protected state of the same name, which contains 1000 square miles, and 100,000 inhabitants.

**DONG-NAI'** is the name of a river and a town in Anam or Cochin-China, an oriental state which has recently derived an adventitious interest from the combined attacks of France and Spain.—1. The river enters the Chinese Sea, by various mouths, about lat. 10° 20′ N., and long. 107° E. It is navigable for large vessels as far up as Sai-gon, which, with a population of 180,000, and a trade of great value, stands 40 miles from the coast. From this city, a canal of 23 miles in length connects the D. with the Menam-kong, or Cambodia, which, in a more westerly channel, divides Anam from Siam.—2. The town is on an affluent of the river, being 25 miles to the north-east of Sai-gon.

**DO'NGOLA** (NEW), or **MARA'KAH**, a town of Nubia, capital of a province of the same name, is situated on the left bank of the Nile, in lat. 19° 10′ N., long. 30° 22′ E. D., which is a military station, is also a place of considerable trade. Its exports are chiefly slaves, in return for which it receives goods of all kinds from Cairo. Its bazaar is well supplied, and it has an indigo-factory belonging to the Egyptian pasha. Pop. estimated at 5000 or 6000. In the vicinity, on the fertile river-island of Argo, are the ruins of old Ethiopian and Egyptian buildings, colossal statues, &c.—OLD DONGOLA is a ruined town on the right bank of the Nile, 75 miles south-south-east of New Dongola. On the east side, the desert in some places stretches down to the water-edge.

**DO'NIS CONDITIONA'LIBUS**, STATUTE DE, called also the Statute of Westminster the Second, 13 Edw. I. c. 1, is the statute which first established in England the power of creating an Entail (q. v.). Before the passing of this act, it had been held by the judges that a conveyance to a man and the heirs of his body was a fee-simple conditional, i. e., a Fee-simple (q. v.) on condition that the donee should have heirs of his body; and this condition having been purified by the birth of an heir, the donee was at liberty to alienate or burden the land, and thus to defeat the original gift. In this respect, however, the gift differed from a fee-simple, that if the donee failed to exercise his power of alienation, and died without issue surviving, the land descended not to the heirs of the donee, but to those of the donor. To counteract the decision of the judges above noticed, the statute *de donis* was passed. It provided 'that the will of the giver, according to the form in the deed of gift manifestly expressed, shall be from henceforth observed.' From the date of this act, the courts recognised two estates in the land—viz., that of the donee, which is called a Fee-tail (q. v.), and that in the donor, which was a reversion or expectancy, by which, on the termination of the estate-tail, the lands would revert to the original owner. As to the manner in which even this intention was defeated, see ENTAIL. Not only lands, but rents, dignities, &c., might be entailed under this act. *Co. Litt.* 20 *a*. See ENTAIL.

**DONIZE'TTI**, Gaetano, a famous Italian composer, was born at Bergamo, in Lombardy, 1798. He learned the elements of music at the Lyceum of that town, and later, the art of composing under Simon Mayr. D.'s first compositions belonged exclusively to church-music, but the only success he obtained by them was an appointment as a chorister at the church of Basilica di San-Maggiore. D. gave up that position very soon, and after several vicissitudes, entered the military service of Austria. D. now devoted himself to the composing of operas, of which he has left more than sixty. *Enrico di Borgogna*, 1819, with nineteen others that followed, failed to produce any marked result; and it was not until 1831 that his renown began to spread beyond Italy. *Anna Bolena*, *L'Elisir d'Amore*, *Lucrezia Borgia*, *Marino Faliero*, *Lucia di Lammermoor*, *La Fille du Régiment*, followed each other in rapid succession, adding new lustre to his fame. D.'s last productions were *Don Sebastiano* and *Caterino Cornaro*. He died at Bergamo in 1848. Among modern Italian composers, D. is reckoned to be nearest to Rossini, whose style he imitated during the first stage of his career. D.'s music is praised not so much for melody as for dramatic truth and solidity of execution.

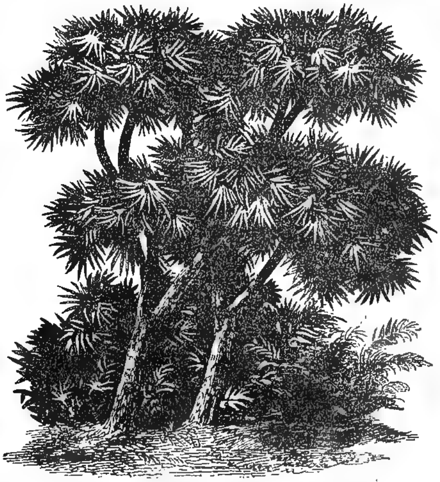
**DO'NJON**, or **DU'NGEON**, the principal tower or keep (q. v.) of a castle (q. v.) or fortress. It was so called either from being placed on a *dun* or elevation, natural or artificial, or because, from its position, it dominated (Lat. *dominio*, corrupted into *domgio*, *dongeo*) or commanded the other parts of the fortress. From the circumstance that the lower or underground story of the donjon was used as a prison, has come the modern meaning of the word. See Castle.

**DONNE**, John, D.D., the son of an eminent merchant, cadet of an ancient family in Wales, was born in London in 1573. His parents were Catholics, and he was educated in that faith. At the age of eleven, he went to Oxford, where he remained three years; thereafter, he removed to Cambridge. Although he greatly distinguished himself at these seats of learning, the faith of his parents prevented him from taking a degree. At the age of 17, he entered Lincoln's Inn, to read for the bar; and while so engaged, he carefully studied the principal points in dispute between Catholics and Protestants, and finally joined the latter. About this time, he wrote several of his minor poems, the erotic heat of which contrasted strangely with the austerity of his later years. In 1594, he went abroad, and lived for three years in Spain and Italy. On his return, he was made secretary to Lord Ellesmere, then Lord Keeper of the Great Seal. Here he fell in love with that nobleman's niece, and they were privately married. When the union was discovered, D. was imprisoned by his enraged father-in-law. After his liberation, he recovered his wife by legal process, and, without settled employment, went to reside at the house of Sir Francis Wooley, a kinsman of his wife. After the death of Sir Francis, he removed to London, and lived with Sir Robert Drury, in Drury Lane. With Sir Robert he went to Paris; and on his return, at the instigation of James I., who was delighted with the *Pseudo-Martyr*, a book which D. had written against the Catholics, he entered holy orders. He was made D.D. by the university of Cambridge; and after accompanying an embassy to the queen of Bohemia, he was made on his return Dean of St Paul's, and vicar of St Dunstan's. A fever carried him off in 1631. His life has been written by Izaak Walton—forming one of the group of 'lives' so praised by Wordsworth in a celebrated sonnet. D.'s works consist of satires, elegies, religious poems, complimentary verses, and epigrams: they were collected and published by his son in 1650. An earlier but imperfect collection appeared in 1633. D. is usually considered as the first of a series of poets of the 17th c., who, under the infelicitous name of the Metaphysical Poets, fill a conspicuous place in English literary history. The directness of thought, the naturalness of description, the rich abundance of genuine poetical feeling and imagery, now began to give way to cold and forced conceits, and elaborate exercises of the intellect. Yet it is generally acknowledged that, amid much rubbish, there is not a little real poetry, and that of a high order, in Donne. His fancy was rich and subtle, his wit singularly keen and poignant, and his word-painting such, that, if he had possessed, in addition, music and sensibility, he would probably have enjoyed a perpetual popularity.

**DOO**, George Thomas, one of the best English historical engravers of the present day, was born in the parish of Christ Church, Surrey, January 6, 1800. He has made himself best known by his famous plate of 'Knox Preaching before the Lords of the Covenant,' after Wilkie; while his admirable rendering of Eastlake's 'Italian Pilgrims coming in Sight of Rome,' his exquisitely finished heads of women and children, after Lawrence, have succeeded in winning for him a very high place in the estimation of the admirers of this most laborious art. But although his conception is just, and his handling firm, free, and masterly, yet the process of conscientious engraving is so slow, and the popular taste has been recently so entirely corrupted by the mezzotint and other showy styles, that Doo, from want of commissions, was compelled to abandon his graving-point, and for some years, he has been painting portraits in oil.

**DOOM**, the old name given to the last judgment, and to those representations of it in churches which have a religious rather than an artistic object. Many of the dooms are executed in distemper. In the reign of Edward VI. most of them were washed over, or otherwise obliterated, as superstitious. There is a fine one still remaining in the church of the Holy Trinity at Coventry.

**DOOM** or **DUM PALM** (*Hyphæne Thebaica*), a species of palm remarkable for the repeated forkings of its stem. It is a native of Upper Egypt and of



Doom Palm (*Hyphæne Thebaica*).

the central parts of Africa. In some districts, it is the most plentiful tree, sometimes even forming forests, sometimes growing amidst the very sands of the desert. Its leaves are fan-shaped. Ropes are made of the fibre of its leaf-stalks. Its fruit is about the size of an orange, but of a somewhat elongated irregular shape; the outer skin is red, and this being peeled off, a considerable thickness of a spongy dry substance is found within it—also part of the *pericarp*—which has an insipid sweetness, and a remarkable resemblance to gingerbread, so that the tree is sometimes called the GINGERBREAD-TREE. This substance is used as an article of food, and an infusion of it as a beverage. The infusion is cooling, gently aperient, and very salutary in fevers. The albumen of the seed is hard and semi-transparent, and is turned into beads and other little ornaments. Each fruit contains one seed. Egyptian bdellium (see BDELLIUM) is said to be an exudation of this palm.

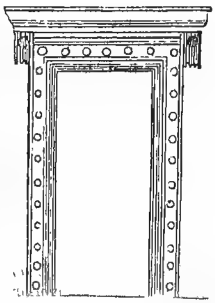
**DOO'MSDAY BOOK.** See DOMESDAY BOOK.

**DOO'MSTER.** See DEEMSTER.

**DOON**, a Scotch river, rising in the south-east of Ayrshire in Loch Enoch. It runs north-west through Loch Doon (5 miles by ¾ mile, amid treeless mountains), past Dalmellington, Burns's Monument, and Alloway Kirk, to the Firth of Clyde two miles south of Ayr. It is 30 miles long. On leaving Loch Doon, the river flows through Glen Ness, a huge rocky and wooded ravine, not surpassed in picturesque beauty by any similar scenery in Scotland. On an islet in the loch are the ruins of Doon Castle, where Edward, brother of Robert Bruce, is said to have lived. Burns has immortalised the D. in song.

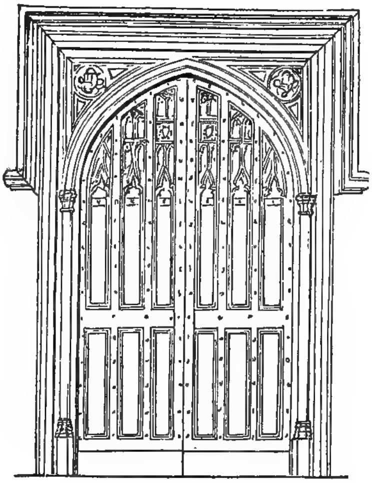
**DOOR AND DOO'RWAY**, in Art. The form of the doorway is determined by the architectural style of the building in which it is placed. In classical buildings, it is generally rectangular in form, though both Greeks and Romans, following the Egyptians, amongst whom the practice was almost universal, occasionally diminished the opening towards the top; and the Romans, in later times, very frequently threw over it the circular arch, which was the characteristic feature of their style. Egyptian doorways are known to us, for the most part, only by the examples which remain in monumental structures; and these, like the other members of the style as thus exhibited, are of gigantic proportions. The doorway of the temple at Edfu measures 74 feet to its summit, but the lintel and cornice which cover it are so deep and massy as to occupy a space of no less than 23 feet, so that the height of the aperture is only 51. With the Egyptians, the doorway was an architectural object of very great importance. On either side of it, colossal statues or obelisks were placed, and the approach to it was often lined with rows of gigantic sphinxes.

The Greek doorway was surrounded by mouldings, and as the lintel or top-stone which covered it projected on both sides beyond the jambs, the mouldings which ran round both jutted out at the place of meeting, forming a sort of shoulders, as in the accompanying example. This arrangement, however, was by no means uniform, the mouldings of the jambs being frequently quite separated from those of the architrave, as in the beautiful doorway of the Erechtheium, of which an illustration is copied from Mr Donaldson's work on Doors. The doors themselves, in antiquity, in private dwellings, were generally of wood; and in structures devoted to religious or public purposes, of metal, and occasionally of marble. They were generally panelled, and turned on pivots working in sockets. With the exception of the forms of the windows, and the tracery and foliage of the pillars, doorways are the most characteristic feature in all the styles of Gothic architecture. In the earliest, which we in this country are in the habit of calling Saxon, and which on the continent is commonly known as Romanic, they are of course very plain. There is seldom more than a few simple mouldings, surrounding a semicircular arch, and in some of the earliest examples, the head of the opening is covered by two flat stones, leaning upon each other in the centre, and their other ends being placed on the imposts, so as to form a triangle. In the Norman style, they become gradually more ornamental. The arch still continued in general to be semicircular, though there are a few instances of the segmental or horse-shoe arch. As the style advanced, the mouldings and enrichments became more various. Of these, that which is most characteristic of the style is the zigzag moulding. Circular or octagonal shafts were now frequently placed in the jambs, and these, too, were often ornamented with zigzag or spiral mouldings, their capitals being enriched with foliage or grotesque heads or figures. The opening of the doorway often does not rise higher than the springing of the arch, and in this case it is generally flat, the semicircular space between it and the arch being frequently ornamented with a sculptured representation of some scriptural subject. The few Norman doors that exist are devoid of ornament, with the exception of projecting nails, and a simple iron scroll-work projecting from the hinge, and stretching to a greater or less extent over the door. As the doorway adheres strictly to the characteristics of the style, early English doorways of course generally terminate in pointed arches. In these the mouldings are more numerous, the jambs contain a greater number of small shafts, some of which occasionally stand quite free, and on the whole the work is richer in form, and more finished in execution. The opening of the doorway is now frequently divided into two, either by a single shaft or a clustered column. In the decorated style, the doorways are not in general so deeply recessed as in the early English; and this circumstance takes from them in richness more than they gain in elegance by their greater height, and by the more delicate character of their ornamentation. In these, the mouldings are commonly enriched with flowers, or foliage, either in running patterns or placed separately at short intervals. Of these, the commonest are the Ball-flower (q. v.), and a flower of four leaves, which often projects boldly, and produces a fine effect. The iron scroll-work on the doors resembles that in the former style, except that the terminations are more frequently worked into leaves or flowers. In other cases, the doors are panelled, and covered with characteristic tracery. In the perpendicular style, though the door continues to be arched, it is usually placed under a heavy square external moulding. The doorway in this style loses much of the depth and richness which belongs to it in the earlier styles which we have been considering. Shafts are still used in the jambs, though not always, and they are generally small and few in number; the capitals of the jambs rarely possess the same richness of foliage, and frequently consist merely of plain mouldings. One or more large hollows are often left in the jambs, forming small niches, which frequently



Doorway of Erechtheium.

contain statues. This latter characteristic seems to be peculiar to the perpendicular style. In the doorways, as well as in the windows of this style, the four-centred arch came into general use, but two-centred arches, and, in small doorways, ogees, are frequently to be met with. The doors in the perpendicular style, when ornamented, are usually panelled, the upper parts being sometimes covered with tracery, but the fine iron scroll-work of the earlier styles had entirely disappeared.



Perpendicular Doorway:
From the Bishop's Palace, Lincoln

**DOOR**, the movable panel by which the opening to an apartment, closet, or passage is closed. Doors are made of wood, iron, bronze, or stone. When moving horizontally on hinges, they are called *swing*-doors; when two such are used to close one opening, they are *folding*-doors. *Sliding*-doors are those which move on rollers, and may be pushed aside. A *jib*-door is one which is concealed as much as possible when shut. A *trap*-door is one which opens vertically over a horizontal opening, as a hole in a floor, &c. When a small door closes an opening cut in a larger one, it is usually called a *wicket*.

Doors are commonly made of wood, and these we shall first describe. The most simply made door is constructed of several boards joined together at their edges by a *rebate*, or a *ploughed and tongued groove* (see CARPENTRY, figs. 19 and 20); these are held together by a transverse piece simply nailed to each board; this is called a *ledge*, and the door thus made, a *ledge*-door. These are commonly used for workshops, stabling, &c.; but when durability and appearance are to be combined, a stout frame is first made, its parts joined together by mortise and tenon. See CARPENTRY, fig. 9. This frame has one or more openings—usually four—which are filled with thin pieces called *panels*, fitted into grooves ploughed in the edges of the frame. The horizontal pieces of the frame are, according to their position, called the top-rail, bottom-rail, lock-rail, and frieze-rail. The lock-rail is that to which the lock is fixed, the frieze-rail intermediate between the middle and top-rail in large doors. The extreme vertical parts of the frame to which the rails are fixed are called *stiles*, and the intermediate vertical part, a *mounting*. Doors are named one, two, four, six, &c., panelled doors, and are further described by the kind of moulding which surrounds the panel, and from the description of panel. The main object of framing, besides appearance, is to counteract the tendency of the wood to warp, by binding the different parts together with pieces having their fibres at right angles to each other.

In many old buildings, the outer, and even some inner doors are made of massive oaken planks, bound together with ornamental iron straps. Iron doors are chiefly used to intercept fire. For this purpose, they are best made of wrought iron, with double sides. Bronze doors are sometimes used for churches and other large buildings. They are usually ornamented with castings in high and low relief. Those of the Baptistery of the cathedral of Florence, by Ghiberti, and the Pantheon of Rome, are among the most celebrated examples. A few examples of marble doors exist, chiefly in cemeteries and some Belgian churches.

**DOO'RA.** See DURRA.

**DOORN**, in English, *Thorn*, is a common name in South Africa. It indicates various communes in the Cape Colony. It also designates two rivers, distinguished as *Great* and *Little*, both of them joining the Olifant, or Elephant, on the right, but the smaller from the south-east, and the larger from the north-east.

**DOO'RNBOOM** (*Acacia horrida*), the most common tree in the wastes of South Africa. The name D. (*Thorn-tree*), given to it by the Dutch colonists, and the botanical specific name, are due to the number and sharpness of its spines. It seldom much exceeds thirty feet in height, but its timber is hard and tough, and is much used for house-carpentry, &c. See ACACIA.

**DOQUET**, or **DO'CKET** (from the same root as *dock*, to cut off or clip), a small piece of paper or parchment, containing a brief or summary of a large writing. All attestations or declarations annexed to written instruments are called doquets, more particularly those that are done by a notary. The notarial doquet is said to be the most ancient example of fixed style in Europe; and though latterly appropriated to the instrument of sasine, it was formerly common to all solemn instruments. It consisted of a Latin attestation, holograph of the notary, annexed to the notarial instrument prepared by him. The name of the notary was set forth, and the authority mentioned, by which he had been appointed to be a notary. In the case of an instrument of sasine, it stated that he was personally present with the witnesses; that he saw, knew, heard, and noted the circumstances mentioned in the sasine; that he prepared the instrument, and the number of pages it contained. In addition to his subscription, the notary was formerly in use in Scotland to add his *signum*, which was a flourish of the pen, called a paraph or ruck. Latterly, he only subscribed the document on each page; and on the last page, opposite to the doquet, he added to his subscription the motto which he had assumed on his admission as a notary. The notarial doquet of instruments of sasine was superseded by 8 and 9 Vict. c. 35, s. 5.

**DOR.** See DUNG BEETLE.

**DOR**, or **MONT DOR** (often written less properly Mont d'Or), a chain of mountains in France comprised in the great group of the Auvergne (q. v.) mountains in the department of Puy-de-Dome. They are clearly of volcanic formation, and rise in the Puy-de-Sancy, which is the highest peak of Central France, to the height of 6190 feet.

**DORA'K**, a town of Persia, in the province of Khuzistan, situated on a marshy plain at the junction of the Dorak with the Jerrahi, lat. 30° 35′ N., long. 48° 50′ E. It is surrounded by a mud-wall, and defended by a fort. The houses, which have sloping roofs, are built for the most part of sun-dried bricks. By a canal which unites the Dorak with the river Karun, a considerable trade is carried on. D. is also reported to have thriving manufactures. Pop. 6000.

**DORA′MA**, a town of Arabia, 32 miles north-east of Derreyeh. The population, nearly 8000 in number, are chiefly engaged in agricultural pursuits. The caravans from Mecca to Persia halt here to obtain supplies. D. was taken by Ibrahim Pasha in 1818, and its inhabitants nearly all slaughtered.

**DO′RCAS SOCI′ETY**, the name given to an association of ladies who collect and dispose of garments with the benevolent object of giving aid to necessitous families. Sometimes the ladies connected with a congregation unite to form a Dorcas society, in order to afford employment to poor needlewomen. Societies of this kind are so called from what is recorded in Acts ix. 39: ‘And all the widows stood by him weeping, and shewing the coats and garments which Dorcas made, while she was with them.’

**DO′RCHESTER**, a parliamentary and municipal burgh, the county town of Dorsetshire, in the south part of the county, on the right bank of the Frome, and on the South Downs, 115 miles south-west-by-west of London. It lies on a slight elevation, is nearly encircled by a fine avenue, and consists chiefly of three spacious streets. There is a cavalry barrack near the town. It has a considerable trade in ale and beer, and sends much butter to London. Pop. (1861) 6823. It sends two members to parliament. D. was the Roman *Durnovaria* or *Durinum*, a walled town with a fosse, and a chief Roman British station. Parts of the wall, six feet thick, remained till 1802. Near D. are the remains of the most perfect Roman amphitheatre in England, 218 by 163 feet, and 30 feet deep, the seats rising from the arena, cut in the chalk, and capable of holding 13,000 spectators. There is also a Roman camp with a ditch and high vallum. A large British station occurs near D., with three earthen ramparts, a mile and a half in circuit, and pierced by intricate passages, and enclosing barrows. The inner rampart is 60 feet high. Roman urns, coins, and tesselated pavements have been found near Dorchester. In 1613, 300 houses and 2 churches were burned in the town. In the Civil War, many battles occurred near Dorchester. Here, in 1685, Judge Jeffreys, in his ‘bloody assize,’ sentenced to death, in two days, 109 persons, implicated in Monmouth's rebellion.

**DORDOGNE**, a department in the south-west of France, formed of the ancient province of Périgord, with small portions of Limousin, Angoumois, and Saintonge, lies in lat. 44° 35′—45° 43′ N., and long. 0°—1° 28′ E. Area about 3500 square miles. Pop. 504,651. D. is watered by the Dordogne, which flows from east to west through the south of the department, and by its tributaries, the Drome, and the Higher and Lower Vezere. The surface is for the most part hilly, and covered with broom and underwood, with here and there a valley of extraordinary beauty and fertility, enclosed with hills, the sides of which are generally clothed with vineyards. There is a great deficiency of corn, but the want, as an article of food for the inhabitants, is supplied to some extent by the immense produce of the chestnuts, which, with the walnut and the oak, are the prevailing trees in the forests. The climate is generally mild. Mines of coal, iron, and manganese are worked; marble, alabaster, and millstones are quarried. The manufactures are coarse woollens, hosiery, brandy, oil, paper, &c. D. carries on considerable trade in iron, wine, hams, and truffled turkeys. The arrondissements are five in number—viz., Bergerac, Nontron, Périgueux, Ribérac, and Sarlat, with Perigueux as capital.

**DO′RDRECHT.** See DORT.

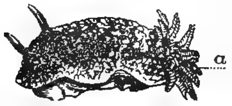
**DO′RIA, ANDREA**, a noble Genoese, and one of the greatest admirals of his age, was born at Oneglia in 1468. At an early age, he took service in the guard of the pope, Innocent VIII., and afterwards distinguished himself in the battles which the Milanese and the French fought against Genoa and the kings of Aragon. It was D. who, in 1503, after a short campaign, crushed the rebellion in Corsica. When Genoa, in 1513, got rid of the French domination, D. was appointed captain-general of the galleys, in which capacity he carried on a war of extermination against the dangerous swarms of African pirates who infested the Mediterranean. During the war between Francis I., king of France, and Charles V., emperor of Germany, and king of Spain, D. commanded the French fleet, reinforced by his own galleys, and inflicted everywhere severe losses upon the enemy. After the defeat of Francis I. near Pavia, D. accepted the command of the papal fleet; but upon the return of the king from his captivity, entered once more the French service, with the title of High Admiral of the Levant. He blockaded Genoa, for having espoused the cause of the emperor, and putting to flight the party of the Adorni, took the town. On finding the independence of his country threatened by the French, D. with his whole force went over to the emperor, and by so doing hastened the deliverance of Italy from French domination. In 1529, D. entered Genoa without resistance, and refusing the title of sovereign, which was offered by the emperor, established there a popular form of government, which remained in vigour up to the end of the republic. The grateful country decreed him the title of ‘Father of Peace;’ and the emperor, in whose service D. continued, conferred upon him the order of the Golden Fleece, together with the principality of Melfi. In 1532, D. won a decisive victory over the Turks near Patras, and the conquest of Tunis (1535) was chiefly his work. He took part in the joint expedition against the Turks under Barbarossa in 1539, and in another against Algiers in 1541, where he lost eleven of his own galleys. The tranquillity of his last years was disturbed by the conspiracy of Fieschi. D. took fierce revenge upon the conspirators for the death of his nephew Gianettino. D. died without offspring, in 1560, at Genoa, in his 93d year.

**DO′RIANS**, one of the four principal peoples of Greece, who took their name, according to the legend, from Dorus, the son of Hellen, who settled in Doris; but Herodotus says that in the time of King Deucalion they inhabited the district Phthiotis; and in the time of Dorus, the son of Hellen, the country called Histiæotis, at the foot of Ossa and Olympus. But the statement of Apollodorus is more probable, according to which they would appear to have occupied the whole country along the northern shore of the Corinthian Gulf. Indeed, Doris Proper was far too small and insignificant a district to furnish a sufficient number of men for a victorious invasion of the Peloponnesus. In this remarkable achievement they were conjoined with the Heracleidæ, and ruled in Sparta. Doric colonies were then founded in Italy, Sicily, and Asia Minor. Strikingly as all the four nations of Greece differed from each other in language, manners, and form of government, the D. in particular differed from the

Ionians. The former preserved a certain primitive solidity and earnestness, but with it something coarse and hard. See O. Müller's *Die Dorier* (2 vols. Breslau, 1824; 2d ed. 3 vols., 1844). The *Doric dialect* bore the same character; it was harsh and rough, while the Ionian was soft and polished, yet the former had something venerable from its antiquity, and was therefore employed in hymns and choruses. In philosophy, the influence of the Doric character was particularly visible in the Pythagorean school and its attachment to the aristocracy. It is no less traceable in architecture in the strong unadorned Doric pillars, which form so marked a contrast to the slender and decorated Ionian columns.

**DO'RIC ORDER.** The oldest, strongest, and simplest of the three orders of Greek architecture. See COLUMN, ENTABLATURE, GREEK ARCHITECTURE.

**DO'RIS**, a genus of gasteropodous molluscs of the order *Nudibranchiata*, the type of a family called *Doridæ*, and sometimes popularly SEA-LEMONS. The body is oval, the abdomen flat, the back flat in some and elevated in others, the mouth a small proboscis with two small tentacula, the vent situated in the back, and surrounded by a circle of branched or plumed gills. The species are found in all seas, many in those of Britain; but they are more numerous in the southern hemisphere. Some of them attain a considerable size. Few of them inhabit deep water. They crawl on rocks, sea-weeds, &c., where they are often left by the tide, or swim in a reversed position; the foot, made concave by muscular action, serving to buoy them up. Some of them are pretty and interesting inmates of the aquarium. Gosse mentions, that specimens of *D. bilamellata* were 'very social in confinement, continually finding out one another, and crowding close up together.'—*A Naturalist's Rambles on the Devonshire Coast.*



Doris: *a*, gills.

**DORIS**, a small mountainous district of ancient Hellas, between Phocis, Ætolia, Locris, and Thessalia, was the earliest home of the Dorians. With its four towns, Boium, Cytinium, Erineus, and Pindus, it formed the Doric Tetrapolis, which was afterwards completely destroyed by the Macedonians, Ætolians, and other nations, so that at the time of the Romans, only a few remains of these towns were visible.—D. was also the name of a district in Asia Minor on the coasts of Caria, inhabited by colonists from the Peloponnesus; it formed a *Hexapolis.*—In modern Greece, D. forms an eparchy of the government of Phocis.

**DO'RKING**, or **DA'RKING**, a town in England, in the middle of Surrey, stands in a picturesque valley on the left bank of the Mole, 23 miles south-west of London by road. It lies on the Roman road which ran between London and Chichester. Pop. (1861) 6990. Its chief trade is in flour, lime, and chalk from the adjacent pits. Dorking gives its name to a peculiar breed of domestic fowl. See POULTRY.

**DO'RMANT** (Fr. sleeping). In heraldic representation, an animal dormant has its head resting on its forepaws, whereas an animal couchant has its head erect.

**DORMANT VITA'LITY** is a term used to designate a peculiar condition which is manifested by many organised beings, and which is characterised by an apparent suspension of all the vital actions. Beings in this state can scarcely be said to be *alive*, since they exhibit no vital activity, nor can they be designated as *dead*, since that implies their incapability of resuming their former state; hence, since they retain their peculiar attributes without manifesting them, the term dormant vitality seems the most appropriate for them. This condition may result either from the withdrawal of the stimuli necessary for the maintenance of vital actions (as water, heat, &c.), or it may proceed from some change in the organism itself, whereby its power of responding to these stimuli is for a time diminished or lost. We shall illustrate our meaning by a few striking examples of each kind of dormant vitality.

1. Dormant vitality from the withdrawal of the necessary stimuli.

Seeds deprived of access to air and moisture may retain their vitality for an enormous time. 'I have now before me,' says Dr Lindley, 'three plants of raspberries which have been raised in the gardens of the Horticultural Society, from seeds taken from the stomach of a man whose skeleton was found thirty feet below the surface of the earth, at the bottom of a barrow that was opened near Dorchester. He had been buried with some coins of the Emperor Hadrian, and it is probable, therefore, that the seeds were 1600 or 1700 years old.' A more remarkable illustration of the vitality of seeds is afforded by a case communicated to Dr Carpenter, and published in his *General and Comparative Physiology*, the facts of which may be shortly stated as follows: In a town in the state of Maine, about 40 miles from the sea, a well was being dug, and at a depth of about 20 feet a stratum of sand was found, which excited interest, from the circumstance that no similar sand was known to exist nearer than the sea-beach. It was, in the first instance, collected in a heap, but was subsequently scattered about the spot on which the heap had stood. In a year or two, when the very existence of the sand was almost forgotten, it was observed that a large number of small trees were growing up on the ground where it had been strewed. They turned out to be beach plum-trees, and they actually bore the beach-plum, which had never before been seen except immediately upon the sea-shore. These trees had therefore sprung up from seeds which were in the stratum of sea-sand that had been pierced by the well-diggers, and had probably retained their vitality through a period of time beyond the estimation of human calculation—the period, namely, in which the sea had gradually receded forty miles from its present limits.

Among the lower animals, we find several of comparatively complex structure, in which dormant vitality can be induced for a considerable period, as, for instance, several years by the abstraction of their *moisture.* The well-known rotifer, the wheel-animalcule, may be reduced to a state of perfect dryness, and kept in this condition for a great length of time (certainly three or four years, and some writers say far longer) without evincing a sign of life, and yet it will immediately revive on being moistened. The *Tardigrades*, an allied tribe, have been desiccated by the most powerful means which chemistry affords, and have been then heated to a temperature of 250°, and have still been revived by water, although in their active state a temperature of 120° destroys them. In Woodward's *Manual of the Mollusca*, cases are recorded of living snails crawling out of shells which were supposed to be empty, and in which they must have been dormant for several years, and the eggs of snails and others of the lower animals have a still greater power of revivification after drying. Sir James Emerson Tennent describes various fishes in Ceylon which bury themselves in the mud when the pools or tanks dry up, and remain torpid until the periodic rains of that country ensue, and previous observers had noted similar facts in other tropical countries. Humboldt relates that crocodiles and boas are sometimes found alive, though torpid, in hardened mud, and revive on the application of water.

A *diminution of temperature* will induce this phenomenon in many animals. In one of Captain Sir James Ross's voyages, several caterpillars having been exposed to a temperature of 40° *below zero*, froze so completely, that when thrown in a tumbler they chinked like lumps of ice. When thawed, they resumed their movements, took food, and became transformed into the chrysalis state. One of them, which had been frozen and thawed four times, subsequently became a moth. In the North American lakes, frozen fishes are often found in the ice, which revive when gently thawed. Spallanzani kept frogs and snakes in a torpid state for three years in an ice-house, and then revived them by warmth. The same capability does not exist, at all events to the same extent, in the warm-blooded animals. A *total* suspension of vital activity in a bird or a mammal for any length of time, from the prolonged application of severe cold, or from any other cause, is never followed by recovery. The stories of certain birds burying themselves in the mud during winter, are regarded by the best authorities as more than questionable; and in hybernating mammals (see HYBERNATION), the suspension is not total. How we are to explain, or whether we ought to believe, the remarkable cases of certain Indian fakirs, who are stated to have the power of suspending all their vital activity for days, or even weeks, we do not know. The late Mr Braid of Manchester published a collection of these cases, directly obtained from British officers who had been eye-witnesses of them in India, in his *Observations on Trance or Human Hybernation*, 1850. We quote one of these, vouched for by Sir Claude Wade. The fakir was buried in an underground cell, under strict guardianship, for *six weeks;* the body had been twice dug up by Runjeet Singh (at whose court the exhibition came off) during the period of interment, and had been found in the same position as when first buried. In this and in all the other recorded cases, the appearance of the body when first disinterred is described as quite corpse-like, and no pulsation could be detected at the heart or in the arteries. The means of restoration employed were chiefly warmth to the vertex, and friction to the body and limbs.

2. Dormant vitality from changes within the organism.

The insect world affords us the chief illustrations of this variety of dormant vitality. The pupa or chrysalis stage of insect life is in itself one of dormant vitality, unconnected with any of the external influences which we have been describing. That this stage may be much shortened by artificial heat, and prolonged by artificial cold, has been known since the time of Reaumur; but, as the following case shews, there are other causes inherent in the animal itself, which tend at a certain time to prolong the pupa condition. In the *Papilio Machaon* there are two generations every year; for the butterfly that comes forth in the early summer lays eggs which rapidly pass through all the phases of insect life, and produce another set of eggs later in the season, whose *larvæ* or caterpillars turn into *pupæ* before the winter. The pupa stage of the first brood (in July) lasts only thirteen days, while that of the second brood (which commences in September) lasts nine or ten months, the butterfly not appearing until the following June. The difference of temperature is obviously quite insufficient to account for the great diversity between the two periods. Several other similar cases may be found in Kirby and Spence's *Entomology*.

**DO'RMER, or DORMER WINDOW**, is a window placed in a small gable rising out of a sloping roof, often made use of for the purpose of enlarging and lighting the attic or garret-rooms of modern houses. It is also popularly known as a storm-window. *Dormers* do not appear to have been invented before the middle of the 14th century.

**DO'RMITORY** (Fr. *dormitoire*, from Lat. *dormire*, to sleep), a sleeping apartment in a monastery, or other religious establishment. Dormitories are usually of considerable size, sometimes having a range of cells parted off on each side.

**DO'RMOUSE** (*Myoxis*), a genus of rodent quadrupeds, ranked by some naturalists in the family *Muridæ* (Rats, Mice, &c.), and by others in the family *Sciuridæ* (Squirrels, &c.); being, in fact, a connecting link between the one family and the other. Their habits resemble those of squirrels; the dentition, however, more nearly agrees with that of mice. There are four molar teeth on each side in each jaw: the upper jaw has not the anterior rudimentary fifth molar, characteristic of squirrels. The molars have their summits marked by transverse ridges. There are no cheek-pouches. The ears resemble those of mice. The fore-paws have each four toes and a rudimentary thumb; the hind feet have five toes. The fur is very fine and soft. The tail is long, and in the different species exhibits characters variously intermediate between those of mice and squirrels. This genus and the closely allied genus *Graphyurus* are remarkable as the only genera of rodents in which there is no cæcum. The species of D. are beautiful little animals, natives chiefly of the south of Europe. Some species are also found in Africa, and the genus *Graphyurus* is entirely African. The only British species of D. is the COMMON D., RED D., or MUSCARDINE (*M. avellanarius*), an inhabitant of woods in some parts of England. It is about the size of a common mouse, with head proportionally large; has a rather pointed muzzle, large prominent eyes, and a flattened tail, thickly clothed with rather long hair; and is of a tawny red colour on the upper parts, and white beneath. It is extremely gentle and easily tamed, feeds on beechmast, acorns, hazel-nuts, grain, &c., and spends the colder parts of winter in a state of torpidity, although in mild weather it wakens up to consume a little of the store of food which, like squirrels, it lays up for that season. Before its hybernation begins, it is generally very fat, nor does it become emaciated by hybernating. It makes a nest of tangled or interlaced herbage opening from above, usually in copse or underwood; and produces about four young ones

Dormouse (*Myoxis avellanarius*).

at a birth. It often assumes a remarkable posture in feeding, suspending itself by its hind feet; more generally it sits upon its haunches, and holds its food in its fore-paws. This species is found in all parts of continental Europe, from the Mediterranean to Sweden.—The FAT D. (*M. glis*) is a larger species, grayish brown, about the size of a rat, with tail very like that of a squirrel, a native of the south of Europe, where it inhabits forests, leaping from branch to branch with great agility. It is eaten by the Italians, as it was by the ancient Romans, who highly esteemed it, and fattened it for the table in receptacles called *gliraria*.—The GARDEN D. (*M. nitela*), common in Europe as far north as Poland, is frequently found in gardens, and even in outhouses. It is often very destructive of the fruit of wall and espalier trees. It is rather smaller than the Fat D., grayish brown, black round the eyes, and has the tail tufted only at the extremity. All the species of D. hybernate; and from this circumstance the name seems to be derived (Lat. *dormio*, to sleep).

**DO'RNBIRN**, a town of Austria, in the north-west of Tyrol, about 8 miles south of the eastern extremity of the Lake of Constance, is situated on the Lossen, a small mountain stream. The houses are widely scattered. The women of D. are chiefly employed in muslin-embroidery; the men are for the most part carpenters, and are principally engaged in the construction of wooden houses, which are carried in detached pieces to the market-town (Bregenz), and are thence exported. Pop. 6600.

**DO'RNICK, DORNIC, DORNOCK**, a species of figured linen, for a full description of which see Ure's *Dict. of Arts and Manufactures.* Dornicks were formerly made in considerable quantity at Dornich, or Tournay, in the Netherlands, and hence their name. From this place, the manufacture was probably carried to Norfolk by the Dutch, who emigrated thither during the persecution of the Duke of Alva. By a statute, 5 and 6 Ed. VI. c. 24, this manufacture, or 'mystery,' carried on at Norwich, is carefully protected. All persons, except those residing in Norwich or Pulham, are forbidden to carry on the 'mystery,' under pain of forfeiture of the article, and of the sum of 6*s.* 8*d.* for every six yards so made. By 4 Will. and Mary, c. 5, s. 2 (68), a duty of 10 per cent., in addition to duties previously levied, is laid on all tapestry or dornicks imported, except from France. It is scarcely necessary to add, that these stringent provisions are no longer in observance.

**DO'RNOCH**, a royal burgh and county town of Sutherlandshire, situated near the entrance to the DORNOCH FIRTH—an inlet of the North Sea, running 25 miles inland, and separating Sutherland from Ross-shire. The cathedral stands in the centre of the town, and is an object of considerable attraction. It is said to have been begun in the 11th c. by St Bar, and was enlarged in 1270 by Bishop Gilbert Murray. It was burned in 1570, and thereafter partially repaired. In the year 1837, it was to a certain extent restored by the late Duchess of Sutherland. It is in the shape of a cross, and is surmounted with a tower and clock spire. The interior is fitted up and used as the parish church. D. was, in olden times, the residence of the Bishops of Sutherland and Caithness. The west tower of the Bishop's palace stands immediately opposite to the cathedral. Next to it is a handsome building, in the old English style of architecture, for the courts of law and public offices. The town has a neat, clean appearance, and is lighted with gas. It is considered one of the best bathing-places in the north, and has extensive 'links,' fit for archery, golfing, and other exercises. D. is one of the six northern burghs which send a member to the House of Commons. It was constituted a royal burgh by Charles I. in 1628. The last victim in Scotland to the laws against witchcraft was burned here in 1722. Pop. (1861) 647.

**DORO'GH**, a town of Hungary, 20 miles north-north-west from Debreczin, situated in the midst of a very fertile district. The population, 6640 in number, are chiefly engaged in agricultural pursuits.

**DOROGOBU'SH, or DOROGOBOUGE**, a town of Russia, in the government of Smolensk, is situated on the left bank of the Dnieper, about 50 miles east-north-east of Smolensk. It is a small town, but pretty, and well built, and has some manufactures. Pop. 5000. At D., the French, under Eugene, in their retreat from Moscow, encountered many disasters.

**DORO'SMA**, a town of Central Hungary, Little Cumania, 6 miles west-north-west of Szeged. It contains a Roman Catholic high school. Pop. 8800.

**DO'RPAT, or DERPT** (Russian, *Guriev*, Esthonian, *Tartolin*), a town of Russia, in the government of Livonia, is situated on the Embach, here crossed by a fine granite bridge, 150 miles north-east of Riga, and is built in the form of a semicircle. It consists of a town proper, with two suburbs. Its streets are straight and clean; its houses, which are mostly of one story, are built of brick or wood, have handsome fronts, and are often showily painted. It is the winter residence of the Livonian nobles and gentry. The Domberg Hill, at the north-west extremity of the town, is tastefully laid out in avenues and promenades; its summit, formerly the site of a cathedral, destroyed by fire in 1775, is now occupied by an observatory, the university library, schools of anatomy and natural history, museums, &c. The observatory—one of the most renowned in Europe, and long presided over by the celebrated Struve—possesses a great refracting telescope, presented by the Emperor Alexander I. The university, founded in 1632 by Gustavus Adolphus, suppressed in 1656 by the Muscovites, and re-established by Alexander I. in 1802, is also famous. It supports a large staff of professors (about 70), and is attended by 600 students, of every religious denomination, who are taught theology, ethics, law, medicine, natural philosophy, and natural history, which is here a favourite branch of study. It is also the chief school of the Protestant clergy in Russia, and the Reformed Synod of Wilna send their students hither. D. has a botanical garden, containing 18,000 plants, some of which cannot be obtained in any other botanical garden in Europe. D. was formerly a walled town, and the ramparts still exist, but have been converted into public walks. The chief employment of the people consists in supplying the wants of those connected with the University. Pop. 14,000.

**DORRE ISLAND**, lying to the north of Dirk-Hartog Island (q. v.), in lat. 25° 10′ S., forms, like its southern neighbour, part of the breast-work of Shark Bay, in Western Australia. It is 20 miles long.

**DORSE** (*Gadus callarias*, or *Morrhua callarias*), a fish of the same genus with the cod, haddock, &c.; plentiful in the Baltic and in other northern seas, but scarcely known on the coasts of Britain. It never attains so great a size as the cod, being seldom more than two feet in length, but much resembles it in form and colour, although its colour is more variable, from which it has received the name of VARIABLE COD. It is also called the BALTIC COD. It differs from the cod in the greater length of the upper jaw. It enters the mouths of large rivers. It is in great request on the coasts of the Baltic, being esteemed the best fish of all this family.

**DO'RSET**, Earl of. See Sackville.

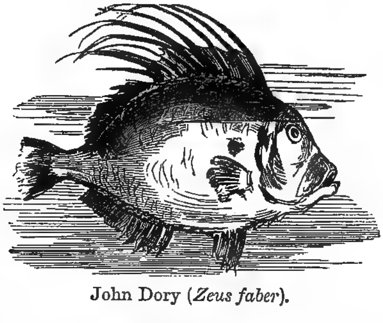
**DO'RSETSHIRE**, or **DO'RSET**, a maritime county in the south of England, on the English Channel, between Devonshire and Hampshire. Its greatest length is 58 miles; greatest breadth, 40; average, 21; area, 1006 square miles; a third being arable, a ninth waste, and the rest in pasture. The coast-line is 75 miles long, with some cliffs and headlands. St Alban's Head is 344 feet high. Portland Isle (q. v.) is connected with the mainland by Chesil Bank. The surface is uneven and bleak. Chalk downs run along the south coast and through the middle of the county nearly from east to west. The highest point is Pillesden Pen, 934 feet. The chief rivers are the Stour, 65 miles long, and the Frome, 35. Geologically, D. consists of strata of plastic clay, chalk, oolite, lias, with some weald and greensand. Remains of colossal reptiles have been found at Lyme Regis. The chief mineral productions are the celebrated Purbeck and Portland building-stones, coarse marble, and white china and pipe clays. The climate is mild. The chalk hills or downs are covered with short fine pasture, on which countless numbers of South-down sheep are fed. The soil is chiefly sand, gravel, clay, and chalk. D. is mainly a pastoral county, producing sheep, cattle, cheese, and butter; but some wheat, barley, hemp, linseed, hops, &c., are raised. Sanfoin is grown on the chalk hills. There are manufactures of linen, silk, woollens, flax, hemp, buttons, stockings, and ale and cider. D. is divided into 34 hundreds, 12 poor-law unions, and about 390 parishes. The chief towns are Dorchester, Bridport, Poole, Weymouth, Melcombe Regis, Shaftesbury, Lyme Regis, and Wareham. D. sends 14 members to parliament, 3 for the county, and 11 for the above towns. Pop. (1861) 188,651. In 1851 (pop. being 184,207), there were 664 schools, with 25,004 scholars; 563 churches, 304 being of the Church of England, and 147 Methodists. D. has ancient British and Roman remains, as stone circles, cromlechs, barrows, camps with ramparts and ditches, Roman amphitheatre, three Roman stations. There are remains of 40 abbacies, priories, hospitals, &c. Of the ancient castles, the ruins of Corfe Castle, a seat of the Saxon kings of Wessex, are among the grandest in England.

**DORSTE'NIA.** See Contrayerva.

**DORT**, or **DO'RDRECHT**, a town of the Netherlands, in the province of South Holland, situated on an island formed by the Maas, about twelve miles south-east of Rotterdam. An inundation in 1421, in which upwards of 70 villages were destroyed and 100,000 people drowned, separated the site upon which D. stands from the mainland. D. is fortified on the south side, and its position is naturally so strong, that though frequently besieged, it has never been taken. It is one of the oldest towns in Holland, and some interesting historical particulars attach to it. Here, in 1572, the states of Holland, after their revolt from Spain, held their first assembly, and declared the Prince of Orange to be the only lawful governor of the country. In 1618—1619, the conclave of Protestant divines known as the Synod of Dort, met here, and condemned the doctrines of Arminius as heretical, and affirmed those of Calvin. (For an account of the questions at issue, see Arminius.) The Gothic building in which the synod sat, whose miraculous labours, according to the president's closing address, 'made hell tremble,' is now used as a public-house, and the particular room in which they met is degraded into a dancing-saloon. Among the principal buildings of D. are a Gothic church with a tall square tower, and containing a beautiful marble pulpit, and the town-hall. The town is traversed by canals, and the Rhine and the Maas afford it great facilities for trade. Large ships can go quite up to the quays. Gigantic wood-rafts, valuing sometimes as much as £30,000 each, obtained from the Black Forest and Switzerland, come down the Rhine to D., which has numerous saw-mills, ship-building docks, salt and sugar refineries, bleacheries, and manufactures of tobacco, white-lead, &c. It has also a considerable trade in corn, flax, oil, timber, and salt-fish. Pop. 21,000.

**DO'RTMUND**, a town of Westphalian Prussia, on the Cologne and Minden Railway, is situated on the Emscher, in the midst of a fertile district, 47 miles north-north-east of Cologne. It is a walled city, whose history goes back into the earliest middle-age traditions, figuring in the time of Charlemagne under the names of Throtmanni, Tremonia, Trotmunde, and Dortmunde. Subsequently it became a free Hanse town, but was ceded to Prussia in 1815, at the Congress of Vienna. D. is not handsomely built, but possesses various fine religious edifices, among which the most worthy of notice are the churches of St Reinhold and St Mary. The town-hall of D. is one of the oldest in Germany. D. has flour and oil mills, and manufactures of woollen, linen, and cotton fabrics, tobacco, beer, and cutlery, and an important corn-market. Pop. 22,100.

**DORY** (*Zeus*), a genus of fishes, the type of a family, *Zeïdæ*, which is sometimes regarded as merely a group of the great family of *Scomberidæ*, but is at least a very distinct group, characterised not only by an oval and much compressed form of body, but also by a protractile mouth. The teeth are feeble. The species of *Zeïdæ* are distributed in the seas of all parts of the world, although only three occur on the British coasts, and two of these are very rare (see Boar-fish and Opah). In the D. genus, the general surface of the body is smooth and destitute of scales, but spiny scales or bony shields guard the dorsal and ventral edges. The anterior portions of the dorsal and anal fins are spiny, and are very distinctly separated from the spineless portions; the spines of the dorsal fin are prolonged into long filaments, and the tail-fin is rounded. The British species (*Zeus faber*), popularly known as the John Dory, sometimes attains a considerable size: Pennant mentions one which weighed 12 lbs.; but it is seldom seen of much more than 18 inches in length. It is principally found on the southern, and particularly the south-western coasts of England, visiting them, apparently, in pursuit of pilchards; but becomes more rare towards the north. It is highly esteemed for the table, having among modern epicures pretty much the same reputation which it had among those of ancient Rome. It is common in the Mediterranean. The name D. is generally supposed

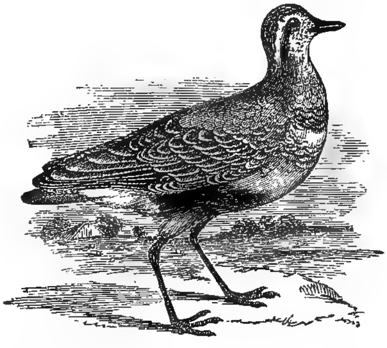


John Dory (*Zeus faber*).

to be properly *dorée* (gilt), and to refer to the prevailing yellowish colour and golden lustre of the fish; whilst the familiar appellation, *John*, is in like manner derived from *jaune* (yellow), although it has been suggested that it may rather be from the Gascon *jau*, a cock—names signifying Cock, Sea-chicken, St Peter's Cock, &c., being given to this fish in different languages. The D. has a remarkable oval black spot on each side. An idle legend refers these spots to the finger and thumb of St Peter, and the D. thus disputes with the haddock the honour of being reputed the fish from whose mouth he took the tribute-money. Other species of D., very similar to the European, are found in the seas of other parts of the world—one of them Australian, exhibiting similar black spots.

**DO'TIS**, a town in the north-west of Hungary, 37 miles west-north-west of Pesth. Between the town proper and its suburb, called *Lake Town*, from its situation on a small lake, are the remains of an old castle, said to have been a favourite residence of Mathias Corvinus, the Hungarian king. D. contains a splendid château, the property of the Esterházy family, the gardens adjoining which are laid out in the English fashion. Pertaining to this castle are some very extensive wine-vaults, one of them containing a tun capable of holding 34,700 English gallons. Pop. 12,600.

**DO'TTEREL** (*Charadrius morinellus*), a species of Plover (q. v.), which in summer inhabits the northern parts of Europe and Asia, breeding chiefly in the highest latitudes, and migrates on the approach of winter to the countries around the Mediterranean and those of similar climate. It appears in Britain as a bird of passage, both on its northward migration in spring, and on its southward migration in autumn. Some breed in the mountains both of Scotland and of England, always at very considerable elevations. The D. is about nine inches and a half in its whole length. In summer plumage, the upper parts are of a brownish ash colour, the feathers edged with deep red; the cheeks, throat, and a band above the eyes, white; the breast bright rust-colour, with a white gorget on the upper part of it, bounded above by a blackish line; a conspicuous black patch on the middle of the belly; some of the tail-feathers tipped with white. The D. has become proverbial for stupidity; but the readiness with which it allows itself to be approached seems to be entirely owing to its coming from regions little frequented by man, and it becomes shy and watchful after a little experience. It is much esteemed for the table, and well known in the London market.



Dotterel (*Charadrius morinellus*).

**DOUAI**, or **DOUAY**, a town of France, in the department of Nord, situated on the river Scarpe, about 20 miles south of Lille, and 150 north-north-east of Paris. It is enclosed within old tower-flanked walls, the ramparts of which are now laid out in pleasant promenades. D. is in general well built, with good streets and some handsome buildings, the principal of which are the parish church, a Gothic town-hall, a cannon foundry, an arsenal, a tall picturesque belfry in the market-place, and a Catholic college, for the education of British Roman Catholics. D. has also a university academy, a royal college, schools of artillery, and of drawing and music, and a high court of justice, having jurisdiction not only over the whole department, but over Pas-de-Calais also. Its manufactures are lace, gauze, cotton, soap, glass, leather, paper, earthenware, beetroot-sugar, &c.; and it has a pretty extensive trade in corn, wine, wool, flax, linen, and brandy. A singular procession of the gigantic figure, made of osiers, of a man clad in armour, takes place every year in July, the monster being moved by eight men inside. Pop. 17,443. D. has existed since Roman times. It was long a bone of contention between the Flemish counts and the French rulers. It passed with the rest of Flanders under the dominion of Spain, but was taken by Louis XIV. in 1667. Marlborough captured it in 1710, but the French re-occupied it after his withdrawal, and were finally confirmed in the possession of it by the peace of Utrecht.

**DOUAY BIBLE.** See Bible.

**DOUBLE CONSCIOUSNESS.** Double or divided consciousness has likewise been designated double personality. The term comprehends a group of morbid mental conditions involving some modification in the clearness of the idea of personal identity. Individuals are often encountered with confused notions of the 'me' and 'not me;' others conceive that parts or properties of their frame belong to another person, or that they are inhabited and ruled by a spirit or entity acting in opposition to their will and interests; and there are others who, at different times and under different circumstances, such as when influenced by, or free from moral or physical stimulation, conceive that they are different persons, and endowed with different qualities and powers. These manifestations, however, do not fully illustrate the state under consideration, which has been described as exhibiting, in some measure, two separate and independent trains of thought, and two independent mental capabilities in the same individual, each train of thought and each capability being wholly dissevered from the other, and the two states in which they respectively predominate, subject to frequent interchanges and alternations. In the most marked or perfect form of this phenomenon, the individual is conscious of the two independent trains of thought, and conceives, in consequence of the apparent independence of these, that he is two distinct persons at the same time. There are few instances of this mental affection on record (see Wigan *On Duality of Mind*, Abercrombie's *Inquiry into Intellectual Powers*, Ellicot in Combe's *System of Phrenology*, 3d edition). A servant-girl, at the period of puberty, gave evidence of double personality for three months. In an advanced stage of the affection, the circumstances which occurred during the paroxysm were completely forgotten by her when it was over, but were perfectly remembered during subsequent paroxysms. She was, for example, taken to church while in her abnormal state. She shed tears during the sermon, particularly during an account given of the execution of three young men, who had described, in their dying declarations, the dangerous steps with which their career of vice and infamy commenced. When she returned home, she recovered in a quarter of an hour, was quite amazed at the questions put to her about the sermon, and denied that she had been in church; but next night, when taken ill, she mentioned that she had been there, repeated the words of the text, and gave an accurate account of the tragical narrative of the three criminals by which her feelings had been so powerfully affected (*Philosophical Transactions*, Edin. 1822). This description assimilates the patient to the class of somnambulists. But such perversions of the faculties generally involve a more palpable and complete duality of mind. The personal identity seems to be lost or impaired. A. B. conceived that he was himself and another person at the same time; he acted as if this belief were sincere, and could not divest himself of the conviction that in his body were two minds or persons suggesting courses of conduct widely opposed. He was certain that his original self, A. B., was a base, abandoned scoundrel, tempting his other, or new, or better self—to whom, it should be noted, was attached the emphatic *Ego*—to commit crimes or acts of which he altogether disapproved. The second person in this duality repelled, struggled with these abominable solicitations, such as that he should commit suicide; and loathed the tempter or first person. This struggle sometimes became real and visible, when the hands, acting under the will of No. 2, or the virtuous and opposing principle, beat and bruised the legs, body, or head, which, it may be presumed, were supposed to belong to No. 1, the vicious or tempting impulse. The object of the one was obviously to inflict pain upon the other. The blows were so severe as to leave marks for days; and when these were adverted to, the answer was, as if from No. 2: 'Don't justify him, he deserved it.' Such conflicts generally occurred during the night, and the interference of the night-watch was required to part or pacify the combatants.* In this case the manifestations of disease might be attributed to the abstruse but vain philosophical inquiries of the mind during health.

While it is quite intelligible that habits of protracted self-analysis, or of that abstraction which loses all idea of distinct personality in the act of thinking, or in the subject occupying attention, may induce such a condition, a more physical explanation has been sought in the alternate morbid activity of different parts of the brain, in the non-consentaneous or independent and alternate activity of the two hemispheres of the brain, which, when acting together, are held to be the organ of the mind in its unity and entireness. Latterly, the views of Sir William Hamilton have been brought to bear upon the point; and still more recently, the theory called 'unconscious cerebration,' which supposes certain impressions to exist unperceived, and to become objects of consciousness only under certain conditions, has been applied to the same purpose; but, in so far as the impairment of the conviction of personal identity is concerned, the problem still awaits solution.

**DOUBLE FLAT**, a musical character used to lower the note before which it is placed two half-tones.

**DOUBLE FLOWERS.** See FLOWER.

**DOUBLE SHARP**, a musical character the reverse of the double flat.

**DOUBLE SHOTTING** is, as its name implies, an augmentation of the destructive power of ordnance, by doubling the shot fired off at one time from a gun. Sometimes three shots are fired at once, in which case the piece is said to be 'treble-shotted.'

**DOU'BLET** (so called from being originally lined or wadded for defence) was a close, tight-fitting garment, the skirts reaching a little below the girdle, as in the accompanying cut, from Fairholt's *Costume in England*. It was almost identical with the jerkin. The sleeves were sometimes separate, and tied on at the arm.

**DOUBLING THE CUBE** was a celebrated geometrical problem among the ancients. The object was, to find the side of a cube whose content should be twice that of another given cube; and various accounts are given of how the problem was suggested. One legend brings the matter into connection with Delos (hence the name of 'the Delian problem'), and relates that the oracle of Apollo in that island, being consulted by the inhabitants during the prevalence of a pestilence, gave for answer, that they should make the altar of Apollo, which was in the form of a cube, as large again. This was done, and yet the pestilence continued; and the oracle being again consulted, replied, that the altar must retain its cubic form, which had not been attended to in the enlargement. This problem perplexed the Delians, as it did mathematicians of after-ages. Even Plato, whom they consulted on the difficulty, could give them no solution, and had recourse, according to the story, to evasion.

The problem, however, is older than Plato; before his time, it had occupied Hippocrates of Chios (not the physician Hippocrates), and was studied afterwards by Eratosthenes, Nicomedes, Hero, and others. Apollonius applied conic sections to the solution of the question, as did also Menæchmus; Nicomedes invented a curve, which he called the conchoid, for the express purpose, and Diocles the cissoid. The analytical method introduced into geometry by Descartes shewed this problem in its true light. It was seen to be only a special case of the solution of a cubic equation—a solution which is impossible by geometry, i. e., by the use of the circle and straight line. It may, however, be represented by the intersection of two conic sections, of which one may be a circle. Descartes made use of the parabola with the circle, which is the simplest way. With numbers, the question is merely one of the extraction of the cube root. If the side of a cube be one foot, its solid content is $1 \times 1 \times 1 = 1$ cubic foot. The side of a cube of double that content, or 2 cubic feet, is $\sqrt[3]{2} = 1{\cdot}259921$.

**DOU'BLINGS**, the heraldic term for the linings of robes or mantles, or of the mantlings of achievements. See MANTLING.

**DOUBLOO'N** (Sp. *dublone*, double) is the name of a gold piece coined in Spain and Spanish America. The Dublon de Isabella, coined since 1848, is of 100 reals, and equivalent to 25·84 French francs, or 20*s.* 8*d.* The older Spanish doubloons vary in value from 85 to 81 francs.

**DOUBS**, a department of France, on the eastern frontier, separated from Switzerland by the Jura

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* Fifth Annual Report, Crichton Royal Institution, 1844, p. 13.

Mountains, is situated in lat. 46° 35′—47° 31′ N., and long. 5° 42′—7° 4′ E. Area about 2000 square miles. Pop. 286,888. D. is traversed by the river Doubs, a tributary of the Saone, and is separated, on the north-west, from the department of Haute Saone by the Oignon, also a tributary of the Saone. The surface is hilly, being crossed by four parallel ranges of the Jura Mountains. The climate is more rigorous than that of most districts in a similar latitude. Among the eastern valleys, where crops chiefly of oats are grown, the harvest operations are often stopped by snow-falls, which lie until April or May. About one-third of the surface is arable; but the greater part is covered with forests. The pine and the walnut attain a huge size, and the common orchard trees thrive well. Maize, potatoes, hemp, and flax are raised. The pasturage is excellent, and rears good breeds of horned cattle and horses, which are exported. In the valleys, great quantities of butter and cheese are produced. The rivers are well stored with fish. Mines of iron and coal are worked, and gypsum and marble are abundant. The trade is principally in iron, cattle, horses, and dairy produce. D. is divided into the four arrondissements of Besançon, Baume-les-Dames, Montbelliard, and Pontarlier. The capital of D. is Besançon.

**DOUCHE.** See BATH and HYDROPATHY.

**DOUGH** is the name given to the moistened and kneaded flour in the first stage of making Bread (q. v.).

**DOU'GLAS**, the largest town and principal seaport of the Isle of Man, is so called from its being situated near the junction of two streams—the *Dhoo* (black) and *Glass* (gray). D. lies on the margin of a highly picturesque bay, on the east side of the island. From the excellence of the sea-bathing, and its central position, it is fast increasing in importance as a watering-place.

The old town, standing on the south-western edge of the bay, consists of narrow tortuous streets, and presents a vivid contrast to the handsome modern terraces and villas which occupy the rising ground beyond. Conspicuous in the centre of the crescent of the bay stands Castle Mona, formerly the residence of John, Duke of Athol, but now converted into a first-class hotel. The Tower of Refuge, a picturesque object, occupies a dangerous rock, in the southern area of the bay, called Conister, and was erected in 1833 for the safety of shipwrecked mariners, by the late Sir William Hillary, Bart., who, during his residence at D., founded the Royal National Life-boat Institution. D. is the principal packet station of the island, and possesses telegraphic communication with England. Pop. (1861) 12,389.

**DOU'GLAS**, THE FAMILY OF. Archæology has failed in its efforts to pierce the obscurity which veils the origin of the heroic race of which it has been said:

> So many, so good as of Douglas blood have been,
> Of one surname, in one kingrick, never yet were seen.

A legend of the 16th or 17th c. told how, about the year 770, a Scottish king, whose ranks had been broken by the fierce onset of a Lord of the Isles, saw the tide of battle suddenly turned by an unknown chief; how, when the victory was won, the monarch asked where was his deliverer; how the answer ran in Erse, *Sholto Du-glas* ('Behold that dark-gray man'); and how the warrior was rewarded with that Clydesdale valley which, taking from him its name of Douglas, gave surname to his descendants. This fable has long ceased to be believed. Equal discredit has fallen on the theory which, sixty years ago, the laborious Chalmers advanced in his *Caledonia*, that the Douglases sprang from a Fleming of the name of Theobald, who, between the years 1147 and 1164, had a grant of lands on the Douglas Water from the Abbot of Kelso. There is no trace of any connection between the Flemish Theobald and the Douglases; nor were the lands which he acquired on one side of the stream any part of their old domain on the other. What was boasted of the Douglases by their historian, two centuries ago, therefore still holds true. 'We do not know them in the fountain, but in the stream; not in the root, but in the stem; for we know not who was the first mean man that did by his virtue raise himself above the vulgar.' It was thought likely, in the beginning of the 15th century, that the Douglases and the Murrays had come of the same stock, and in this old conjecture all that is known on the subject must still be summed up.

1. *William of Douglas*, the first of the family who appears in record, was so called, doubtless, from the wild pastoral dale which he possessed. He is found witnessing charters by the king and the Bishop of Glasgow between 1175 and 1213. He was either the brother or the brother-in-law of Sir Freskin of Murray, and had six sons, of whom Archibald, or Erkenbald, was his heir; and Brice, a monk of Kelso, rose to be Prior of Lesmahago (a dependency of Kelso, on the outskirts of Douglasdale), and in 1203 was preferred to the great bishopric of Murray. He owed this promotion, no doubt, to the influence of his kinsmen the Murrays, and it contributed not a little to the rising fortunes of his own house. He was followed beyond the Spey by four brothers, of whom one became sheriff of Elgin; another became a canon of Murray; a third, who had been a monk of Kelso, seems to have become Archdeacon of Murray; and a fourth, who had been parson of Douglas, appears to have become Dean of Murray.

2. *Sir Archibald, or Erkenbald, of Douglas* is a witness to charters between 1190 and 1232. He attained the rank of knighthood, and beside his inheritance of Douglas, held the lands of Hailes, on the Water of Leith, from the monks of Dunfermline, and had a grant of the lands of Levingston and Hirdmanston from the Earl of Fife. He is said to have acquired other lands in Clydesdale by his marriage with one of the two daughters and heiresses of Sir John of Crawford.

3. *Sir William of Douglas*, apparently the son of Sir Archibald, figures in record from 1240 to 1273. He appears in 1255 as one of the Scottish partisans of King Henry III. of England; and in 1267 is found in possession of the manor of Fawdon, in Northumberland, by gift of the king's son (afterwards Edward I.). He seems to have had a brother, Sir Andrew, the progenitor of the Douglases of Dalkeith and Morton, and certainly had two sons.

4. *Hugh of Douglas*, the elder, acquired land in Glencorse, in Lothian, by marriage with the sister of Sir Hugh of Abernethy; and dying without issue about 1287, was succeeded by his younger brother.

5. *Sir William of Douglas*, distinguished in the family traditions as *William the Hardy*, had all the daring and restless spirit which was characteristic of his descendants. His first appearance is in 1267, when his head was nearly severed from his shoulders in defending his father's English manor from a foray of the men of Redesdale. Twenty years later, he is found at the head of an armed band, carrying off his future wife, a wealthy widow, Alionora of Lovaine, from the manor of her kinsfolks, the La Zouches, at Tranent, in Lothian. We hear of him immediately afterwards as spoiling the monks of Melrose, deforcing the king's officers in the execution of a judgment in favour of his mother, unlawfully

imprisoning three men in his castle of Douglas, and beheading one of them. He was the first man of mark who joined Wallace in the rising against the English in 1297; and for this his lands of Douglas were wasted with fire and sword, and his wife and children carried off, by Robert Bruce, the young Earl of Carrick, then a partisan of England. But the Knight of Douglas soon left the insurgent banners, and submitting to his old patron, King Edward I., to whom he had again and again sworn fealty, was sent prisoner to the castle of York, where he died about 1302. It appears that he possessed lands in one English, and in seven Scottish counties—Northumberland, Berwick, Edinburgh, Fife, Lanark, Ayr, Dumfries, and Wigton.

6. The history of his son, *the Good Sir James of Douglas*, is familiar to every one, as Bruce's greatest captain in the long War of the Succession. The hero of seventy fights, he is said to have won them all but thirteen, leaving the name of 'the Black Douglas'—so he was called from his swarthy complexion—as a word of fear by which English mothers stilled their children. He was slain in Andalusia, in 1330, on his way to the Holy Land with the heart of his royal master, and dying unmarried, was succeeded by his brother.

7. *Hugh of Douglas*, of whom nothing is known except that he made over the now great domains of his family, in 1342, to his nephew, *Sir William of Douglas* (son of a younger brother of the Good Sir James—Sir Archibald of Douglas, Regent of Scotland, slain at Halidon Hill in 1333).

EARLS OF DOUGLAS.—Hitherto, the Douglases had no higher title than that of knight; but in 1357, Sir William of Douglas, who had fought at Poitiers, and distinguished himself in other fields, was made Earl of Douglas, and afterwards by marriage became Earl of Mar. His ambition aimed at still greater things, and in 1371 he disputed the succession to the Scottish crown with Robert II. (the first of the Stewarts). He claimed as a descendant of the Baliols and Cummings; and his pretensions were abandoned only on condition that his son should marry the king's daughter. He died in 1384. His son James, second Earl of Douglas and Mar, the conqueror of Hotspur, fell at Otterburn in 1388; and as he left no legitimate issue, the direct male line of William the Hardy and the Good Sir James now came to an end. His aunt had married for her second husband one of her brother's esquires, James of Sandilands, and through her Lord Torphichen is now the heir general and representative at common law of the House of Douglas.

The earldom of Douglas, meanwhile, was bestowed on an illegitimate son of the Good Sir James—Archibald, Lord of Galloway, surnamed the Grim. By his marriage with the heiress of Bothwell, he added that fair barony to the Douglas domains; and having married his only daughter to the heir-apparent of the Scottish crown, and his eldest son to the eldest daughter of the Scottish king, he died in 1401. His son and successor, Archibald, fourth Earl of Douglas, was, from his many misfortunes in battle, surnamed 'The Tyneman,' i. e., the loser. At Homildon, in 1402, he was wounded in five places, lost an eye, and was taken prisoner by Hotspur. Next year, at Shrewsbury, he felled the English king to the earth, but was again wounded and taken prisoner. Repairing to France, he was there made Duke of Touraine, and fell at Verneuil in 1424. He was succeeded by his son Archibald, who distinguished himself in the French wars, and dying in 1439, was buried in the church of Douglas, where his tomb yet remains, inscribed with his high titles of 'Duke of Touraine, Earl of Douglas and of Longueville, Lord of Galloway, Wigton, and Annandale, Lieutenant of the King of Scots.' His son and successor, William, a boy of sixteen, is said to have kept a thousand horsemen in his train, to have created knights, and to have affected the pomp of parliaments in his baronial courts. His power and foreign possessions made him an object of fear to the Scottish crown; and, having been decoyed into the castle of Edinburgh by the crafty and unscrupulous Crichton, he was, after a hasty trial, beheaded, along with his brother, within the walls of the castle, in 1440. His French duchy and county died with him; his Scottish earldom was bestowed on his grand-uncle (the second son of Archibald the Grim), James, surnamed the Gross, who in 1437 had been made Earl of Avondale. He died in 1443, being succeeded by his son William, who, by marriage with his kinswoman (the only daughter of Archibald, fifth Earl of Douglas, and second Duke of Touraine), again added the lordship of Galloway to the Douglas possessions. He was, for a time, all-powerful with King James II., who made him lieutenant-general of the realm; but afterwards losing the royal favour, he seems to have entered into a confederacy against the king, by whom he was killed in Stirling Castle, in 1452. Leaving no child, he was succeeded by his brother James, who, in 1454, made open war against King James II., as the murderer of his brother and kinsman (the sixth and eighth Earls of Douglas). The issue seemed doubtful for a time, but the Hamiltons and others being gained over to the king's side, Douglas fled to England. The struggle was still maintained by his brothers, Archibald, who by marriage had become Earl of Murray, and Hugh, who in 1445 had been made Earl of Ormond. They were defeated at Arkinholm in May 1455, Murray being slain on the field, and Ormond taken prisoner, and afterwards beheaded. Abercorn, Douglas, Strathaven, Thrieve, and other castles of the Douglases, were dismantled; and the earldom of Douglas came to an end by forfeiture, after an existence of 98 years, during which it had been held by no fewer than nine lords. The last earl lived many years in England, where he had a pension from the crown, and was made a Knight of the Garter. In 1484, he leagued himself with the exiled Duke of Albany to invade Scotland. He was defeated and taken prisoner at Lochmaben, and, on being brought to the royal presence, is said to have turned his back upon the king. The compassionate James III. spared his life, on condition of his taking the cowl. 'He who may no better be, must be a monk,' muttered the old man, as he bowed to his fate. He died in the abbey of Lindores, in April 1488; and so ended the elder illegitimate line of the Douglases.

EARLS OF ANGUS.—Meanwhile a younger illegitimate branch had been rising to great power. William, first Earl of Douglas, was the faithless husband of a faithless wife. She was believed to have had a paramour in Sir William Douglas of Liddesdale. Her jealous husband, who slew that 'flower of chivalry,' had himself shared the affections of the wife of his wife's brother, Margaret Stewart, Countess of Angus and Mar. The issue of this amour, which in that age was accounted incestuous, was a son George, who in 1389 had a grant of his mother's earldom of Angus; married, in 1397, the youngest daughter of King Robert III.; was taken prisoner at Homildon in 1402, and died of the plague in England in the following year. He was succeeded by his son William, who, dying in 1437, was succeeded by his son James, who died without issue, when the title reverted to his uncle. George, fourth Earl of Angus, took part with the king against the Douglases in 1454; his loyalty was rewarded by a grant of their old inheritance of Douglas-dale; and so, in the phrase of the time, 'the Red Douglas'—such was the complexion of Angus—'put down the Black.' He died in 1462, being succeeded by his son Archibald, surnamed Bell-the-Cat, and sometimes also called the Great Earl. After filling the highest offices in the state, and adding largely to the family possessions, he retired to the priory of Canons Regular at Whithern, in Galloway, where he died in 1514. Having outlived his eldest son, he was succeeded by his grandson, Archibald, who, in 1514, married the Queen-dowager of Scotland, Margaret, sister of Henry VIII. of England, and widow of James IV. of Scotland. The fruit of this marriage was a daughter, Margaret, who, marrying the Earl of Lennox, became the mother of Henry, Lord Darnley, the husband of Queen Mary, and father of King James VI. The Earl of Angus had for a time supreme power in Scotland, but in 1528, the young king, James V., escaped from his hands, and sentence of forfeiture was passed against Angus and his kinsmen. The king swore that while he lived the Douglases should have no place in his kingdom; and he kept his vow. On his death in 1542, Angus returned to Scotland, and was restored to his honours and possessions. He died at Tantallon in 1556. His nephew, who succeeded him, died two years afterwards, leaving an only son, Archibald, eighth Earl of Angus. This 'Good Earl,' as he was called, died in 1588, when his title devolved on his kinsman William, the grandson of Sir William Douglas of Glenbervie, second son of Archibald Bell-the-Cat. Dying in 1591, he was succeeded by his son William, who next year obtained from the crown a special recognition of his high privileges as Earl of Angus, of taking the first place and giving the first vote in parliament, of leading the vanguard in battle, and of bearing the crown in parliament. He seems to have been a man of scholarly tastes, and is said to have written a history of the Douglases. Having turned Roman Catholic, he was forced to leave Scotland, and spent his latter years in exercises of devotion at Paris, where he died in 1611, being succeeded by his son.

MARQUISES AND DUKE OF DOUGLAS, AND LORDS DOUGLAS.—William, eleventh Earl of Angus, was created Marquis of Douglas in 1633, and dying in 1660, was succeeded by his grandson James, who died in 1700, leaving issue one son and one daughter. The son Archibald, third Marquis of Douglas, was created Duke of Douglas in 1703, and died childless in 1761, when his dukedom became extinct, and his marquisate devolved on the Duke of Hamilton, as descended in the male line from William Earl of Selkirk, third son of the first Marquis of Douglas. His grace's sister, Lady Jane Douglas, born in 1698, and married in 1746 to Sir John Stewart of Grandtully, was said to have given birth at Paris to twin sons in 1748. One of them died in 1753; the other, in 1761, was served heir of entail and provision general to the Duke of Douglas. An attempt was made to reduce his service, on the ground that he was not the child of Lady Jane Douglas; but the House of Lords, in 1771, gave final judgment in his favour. He was made a British peer in 1790, by the title of Baron Douglas of Douglas Castle, which became extinct on the death of his son James, fourth Lord Douglas, in 1857, when the Douglas estates devolved on his niece, the Countess of Home. The title of Earl of Angus was claimed in 1762, as well by the Duke of Hamilton as by Archibald Stewart, afterwards Lord Douglas; but neither urged his claim to a decision, and the title is still in abeyance. The right attached to it of bearing the crown of Scotland, was debated before the Privy Council in 1823, when it was ruled that Lord Douglas's claim to that honour, being a claim of heritable right, fell to be decided in a court of law. It has been supposed that the motto of the Douglas arms, *Jamais arrière*, 'Never behind,' alludes to the peculiar precedence inherent in their earldom of Angus. The bloody heart commemorates Bruce's dying bequest to the Good Sir James; the three stars which the Douglases bear in common with the Murrays, seem to denote the descent of both from one ancestor.

EARLS OF MORTON.—Sir Andrew of Douglas, who appears in record in 1248, was apparently a younger son of Sir Archibald, or Erkenbald, of Douglas, the second chief of the house. He was the father of William of Douglas, who, in 1296, swore fealty to King Edward I. for his lands in West Lothian, and who was probably the father of Sir James of Douglas—surnamed of Lothian, to distinguish him from his kinsman of Clydesdale—who, in 1315, had a grant from Bruce of the lands of Kincavil and Calder-clere. He died about 1320, being succeeded by his son, Sir William of Douglas of Liddesdale, who acquired the lordship of Dalkeith (by resignation of the Grahames), the barony of Aberdour in Fife, lands in Tweeddale, and great territories in Liddesdale, Eskdale, and Ewesdale which had been forfeited by the Soulises and Lovels. In 1335, he had a grant of the earldom of Athol, but resigned it in 1342. The Knight of Liddesdale—as he was called by his contemporaries, who regarded him as 'the flower of chivalry'—was assassinated in 1353 by his kinsman, William first Earl of Douglas, partly to revenge his wife's dishonour, partly to revenge the death of Sir David of Barclay, who had been assassinated at the instance of the Knight of Liddesdale, in revenge for the slaughter of his brother John. Dying childless, he was succeeded by his nephew, Sir James of Douglas of Dalkeith. This great chief, who died in 1420, saw Froissart sit as a guest at his board; himself possessed books of law, grammar, logic, and romance; and enjoined in his will that all the volumes which he had borrowed from his friends should be returned to them. His alliances were as princely as his life. His first wife was a daughter of 'Black Agnes,' the heroic Countess of Dunbar; his second was a sister of King Robert II.; and he matched his eldest son, Sir James of Douglas of Dalkeith, with a daughter of King Robert III. Their grandson married a daughter of King James I., and in 1458 was created Earl of Morton. His grandson, the third earl, dying without male issue in 1553, the earldom devolved on his daughter's husband, the Regent Morton—James Douglas, great-grandson of Archibald Bell-the-Cat. After his fall, the title went to Archibald eighth Earl of Angus; and when he died childless in 1588, it passed to the lineal male descendant of Sir Henry of Douglas (the son of Sir John of Douglas, the brother of the Knight of Liddesdale), Sir William Douglas of Lochleven, who thus became seventh Earl of Morton. His losses in the great civil war compelled him, in 1642, to sell Dalkeith to the Earl of Buccleuch, and his Tweeddale and Eskdale lands to others; but Aberdour and other old domains of the family still remain with his successor, the Earl of Morton, who, there is every reason to believe, descends legitimately in the male line from William of Douglas, the great progenitor of the race in the 12th century.

EARLS, MARQUISES, AND DUKES OF QUEENSBERRY; EARLS OF MARCH, AND EARLS OF SOLWAY.—James, second Earl of Douglas and Mar—the hero of Otterburn—had an illegitimate son, Sir William of Douglas of Drumlanrig, whose descendants were created Viscounts of Drumlanrig in 1628, Earls of Queensberry in 1633, Marquises of Queensberry in 1682, Dukes of Queensberry in 1684, Earls of March in 1697, and Earls of Solway in 1706. On the death of the fourth Duke of Queensberry in 1810, that title, with the barony of Drumlanrig and other lands, went to the Duke of Buccleuch; the title of Marquis of Queensberry, with the baronies of Tinwald, Torthorwald, &c., went to the heir-male of the family, Sir Charles Douglas of Kelhead; and the title of Earl of March, with the barony of Neidpath, went to the Earl of Wemyss. The title of Earl of Solway had become extinct in 1778.

EARLS OF SELKIRK, FORFAR, AND DUMBARTON; VISCOUNT BELHAVEN, AND LORDS MORDINGTON. —In 1646, the third son of the first Marquis of Douglas was created Earl of Selkirk. In 1651, the eldest son of the same marquis was created Earl of Ormond, and in 1661, Earl of Forfar. In 1675, the fourth son of the same marquis was created Earl of Dumbarton. In 1641, the second son of the tenth Earl of Angus was created Lord Mordington. In 1633, Sir Robert Douglas of Spot, a descendant of the Morton family, was created Viscount of Belhaven. Of all these titles, that of the Earl of Selkirk is the only one not now dormant or extinct.

A *History of the Houses of Douglas and Angus*, by David Hume of Godscroft, was published at Edinburgh in 1644 in 1 vol. fol., and reprinted in 1748 in 2 vols. 8vo. It preserves the traditions of the family, and has some literary merit, but its accuracy is not to be trusted. The earlier history of the Douglases has been critically examined by the late George Chalmers in his *Caledonia*, vol. i. pp. 579—584 (Lond. 1807); by Mr Riddell in his *Remarks upon Scotch Peerage Law*, pp. 174—178 (Edin. 1833); by Mr Cosmo Innes, in the *Registrum Episcopatus Moraviensis*, pp. xliv.—xlvii. (Edin. 1837); and the *Liber S. Marie de Calchou*, vol. i. pp. xxvii., xxviii. (Edin. 1846); and by Mr Joseph Robertson in the *Origines Parochiales Scotiæ*, vol. i., pp. 152—160 (Edin. 1851). The descent of the Houses of Angus and Dalkeith was first ascertained by Mr Riddell in his *Remarks upon Scotch Peerage Law*, pp. 154—164 (Edin. 1833); and in his *Stewartiana*, pp. 82—84, 137—142. The charters and correspondence of the Morton family have been edited for the Bannatyne Club by Mr Cosmo Innes in the *Registrum Honoris de Morton* (Edin. 1853, 2 vols. 4to).

**DOU'GLAS, GAWIN**, a Scottish poet, was the third son of Archibald, fifth Earl of Angus, and was born in the year 1474 or 1475. He was educated for the church, and rose through a variety of inferior offices to the bishopric of Dunkeld. Political events compelled him to leave Scotland. He went to England, where he experienced the most courteous attention at the court of Henry VIII. According to Holingshed, he even received a pension from that monarch, but did not long enjoy it, being suddenly cut off by the plague in 1521 or 1522. He was buried in the Savoy Church. One of D.'s earliest poetic efforts was a translation of Ovid's *Remedy of Love*, but it has not been preserved. In 1501, he wrote his *Palace of Honour*, addressed to King James IV. The leading idea of the poem, and some of the details, strikingly resemble the *Pilgrim's Progress;* yet Bunyan could hardly have seen the poem, and even if he had, could not have spelled his way through it. *King Hart*, the only other long poem of D., presents a metaphorical view of human life. It was probably composed in his later years. But the most remarkable production of this author was a translation of Virgil's *Æneid* into Scottish verse, which he executed in the years 1512 and 1513, being the first version of a Latin classic into any British tongue. It is generally allowed to be a masterly performance, though in too obsolete a language ever to be popular. D.'s verse is far from rhythmical to modern ears; yet the felicitous character of his allegories, and the rich beauty of his descriptions, might well tempt the lovers of genuine poetry to give him a trial. His works, with the exception of his Virgil, have been seldom reprinted, and are very rare.

**DOU'GLAS, JOHN, D.D.**, was the son of a respectable shopkeeper of Pittenweem, Fifeshire, and was born there in 1721. In 1736, he entered St Mary's College, Oxford, where he took his bachelor's degree after five years' study. D.'s life is little more than a chronicle of his very numerous preferments, which ended in his being translated to the see of Salisbury in 1791. He died 18th May 1807. D. only occasionally resided on his livings. He generally spent the winter months in London, and the summer months at the fashionable watering-places, in the society of the Earl of Bath, who was his great patron. He was devoted to literature; but most of his productions were only interesting to his own time. Among other works chiefly of a pamphlet kind, he wrote a *Vindication of Milton from the Charge of Plagiarism, adduced by Lauder* (1750); *A Letter on the Criterion of Miracles* (1754); an ironical pamphlet directed against the Hutchinsonians and Methodists of his day, entitled *The Destruction of the French foretold by Ezekiel* (1759); and the *Introduction and Notes to Captain Cook's Third Voyage* (1781).

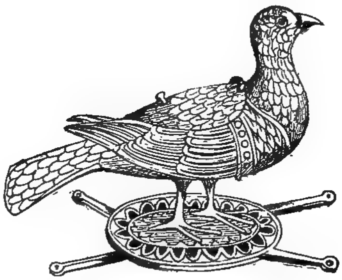
**DOU'GLAS, GENERAL SIR HOWARD, Bart., G.C.B.**, son of Admiral Sir C. Douglas, who received his title for having forced a passage up the St Lawrence to the relief of Quebec in 1776. Born at Gosport, 1776. Entering the army when young, he took part in the expedition to Walcheren, and in the battle of Corunna. He served in Spain and Portugal in 1808 and 1809, in which year he succeeded to the baronetcy, and again in Spain in 1811 and 1812, receiving the cross of Charles III. He was governor of New Brunswick from 1823 to 1829, and an unsuccessful candidate for the representation of Liverpool in 1832 and 1835. He was Lord High Commissioner of the Ionian Islands from 1835 to 1840, and from 1842 to 1847 was M.P. for Liverpool. In 1851 he became a general in the army, and colonel of the 15th Regiment of foot. He has written several treatises, among which are *An Essay on the Principles and Construction of Military Bridges, and the Passage of Rivers in Military Operations* (Lond. 1816); a treatise on *Naval Gunnery* (1819; 4th edit., 1855); *Observations on Carnot's Fortification*, &c. His treatise on *Naval Gunnery* is regarded as a standard authority in foreign countries, although his recommendations were not acted upon by the British Admiralty until thirteen years after the publication of his work. He censured the conduct of the war in the Crimea in 1855, and declared that Sebastopol could not be reduced unless by a change in the plan of operations, such as he traced. His prophecy was verified by the event. He has also published *Considerations on the Value and Importance of the British and North American Provinces*. A treatise, entitled *Naval Evolutions*, states the claims of his father to a brilliant naval manœuvre in 1782, in which year Sir Charles acted as captain of the fleet in Rodney's action with the Count de Grasse.

**DOUR**, a town of Belgium, in the province of Hainault, nine miles west-south-west of Mons. It is well built and prosperous, and has several schools and a literary society. Coal and iron mines are worked in the vicinity; there are also many quarries, and to some extent, weaving, bleaching, and leather-dressing are carried on. Pop. about 6000.

**DOU'RO** (Span. *Duĕro*, Port. *Doŭro*), the name of one of the largest rivers of Spain and Portugal, rises in the province of Old Castile, about 30 miles west-north-west of the town of Soria. From its source it flows south-east to Soria, then winds towards the west, and pursues a general westward direction till it reaches the Portuguese border; it then flows south-west, forming for about 60 miles the boundary between Spain and Portugal; then crossing Portugal and flowing west, it falls into the Atlantic below Oporto. Its Portuguese tributaries are comparatively small. The total length of the river is about 500 miles. The D. is a noble river, and flows through some of the most imposing rock-scenery in the world, as at Barca d'Alva; but is rapid, and of difficult navigation, on account of rocks, sand-banks, &c. It passes through a large portion of the wine-country of Portugal, and conveys the produce to Oporto for exportation in flat-bottomed boats, containing from 30 to 70 pipes each.

**DOVE** (probably from the same root as *dive*, owing to its habit of ducking the head; compare Lat. *columba* with Gr. *kolumban*, to dive), a name sometimes extended, as the name Pigeon also is, to the whole family of *Columbidæ*, sometimes like it restricted—at least when used without prefix—to the genus *Columba* of the more recent ornithological systems. No distinction between the terms dove and pigeon is sanctioned either by constant scientific or general popular use. Audubon attempts to make a distinction, giving the name pigeon to those species of which many nests are built close together on the same trees, and dove to those which are solitary in their nidification; but this distinction is quite unsuitable to the European species, and contrary to British usage. See PIGEON.

**DOVE.** In Christian art, the dove is employed as an emblem of the Holy Ghost, no doubt from the fact of this being the form in which the Spirit descended on our Lord at his baptism. From the dove being also used to symbolise purity, it is generally represented white, with its beak and claws red, as they occur in nature. In the older pictures, a golden nimbus surrounds its head; the nimbus being frequently divided by a cross, either red or black. In stained glass windows we see the dove with seven rays proceeding from it, terminating in seven stars, significative of the seven gifts of the Holy Spirit. Holding an olive branch, the dove is an emblem of peace. When seen issuing from the lips of dying saints and martyrs, it represents the human soul purified by suffering. A dove with six wings is a type of the church of Christ; and when so employed, it has the breast and belly of silver, and the back of gold, two wings being attached to the head, two to the shoulders, and two to the feet. The pyx or box for containing the Host (q. v.) in Catholic churches, is sometimes made in the form of a dove, and suspended over the altar; and the dove is often placed on the covers of fonts. In this position it may still be seen in parish churches in England.



Pyx in the form of a Dove.

**DO'VÉ**, H. W., one of the most celebrated living physicists of the continent, was born in 1803, at Liegnitz, in Silesia, where his father was a merchant. He studied at Breslau and at Berlin, at the latter of which he took the degree of Doctor in 1826. He was successively 'privatdocent' and assistant professor of natural philosophy in Königsberg. Having been transferred to a similar post in Berlin, he subsequently became full professor, and was elected to a seat in the Royal Academy of Sciences. His writings, which are very numerous, are to be found in the Memoirs of that Academy, and in Poggendorff's Annalen, besides several published separately. The most celebrated of these refer to Meteorology, Climatology, Induced Electricity, and Circularly Polarised Light. We may mention among his works *Ueber Maas und Messen* (2d edition, Berlin, 1835), a treatise on the art of measuring, and the origin and comparison of the metrical standards of different nations; *Meteorologische Untersuchungen* (Berlin, 1837), a remarkable treatise; *Ueber die nicht periodischen Aenderungen der Temperaturvertheilung auf der Oberfläche der Erde* (4 vols., Berlin, 1840—1847); *Untersuchungen in Gebiete der Inductionselectricität* (Berlin, 1843). In conjunction with other distinguished German philosophers, D. commenced, in 1837, the publication of an extensive series of treatises on different branches of natural philosophy. This work, called *Repertorium der Physik*, remains unfinished, but many of the treatises it contains, and especially one of several by D. himself, are admirable. To him is due, amongst a great variety of optical discoveries, the application of the stereoscope to the detection of forged bank-notes—an ingenious and useful idea. To English readers, D. is best known by his treatise on the *Distribution of Heat on the Surface of the Globe*, which was published in 1853 by the British Association. In this work he enters fully into the causes of periodic variations of temperature at different parts of the globe, and lays down in admirable charts the monthly and annual isothermal and isabnormal lines—thus tracing the variations in form and position of the different isothermals throughout the year. In addition to the above, D., who is an exceedingly clear and able lecturer, has published several popular volumes on different parts of his subject, among which may be noticed the volume *Ueber Electricität* (Berlin, 1848).

**DOVECOT.** It is enacted by the Scottish statute 1617, c. 19, that no person shall build a dovecot or pigeon-house either in town or country, unless he be possessed of lands or teinds of the yearly value of ten chalders of victual, lying within at least two miles of it. It is also declared, that no person having such qualification shall build more than one dovecot within the 'bounds foresaid.' It has been held that the statute imposes no restraint on proprietors possessed of a greater rent, beyond limiting them to one dovecot for each portion of ground that yields ten chalders yearly. The statute does not extend to dovecots already built, and if a dovecot be challenged, it must be proved to have been built subsequently to the date of the statute, otherwise the contrary will be presumed. If an estate be purchased, or otherwise acquired from a person who was legally entitled to build a dovecot, the dovecot may be legally retained, but cannot be rebuilt if it become ruinous. The statute 2 Geo. III. c. 29, for the protection of pigeons, does not extend to Scotland. See PIGEONS. Dovecot breakers are guilty of theft, and very severe punishments were assigned to them by the old statutes.

**DO'VER**, a parliamentary and municipal borough and seaport in the east of Kent, on the Dover Strait, 66 miles east-south-east of London, at the nearest point of Britain to the continent, being 21 miles from Cape Grisnez, and 25½ from Calais, on the other side of the Strait. It lies at the entrance of a deep depression in an amphitheatre of chalk hills and cliffs. The streets of the old town are narrow and irregular, the chief one being a mile long, running north-west up the valley, but facing the sea there are lines of elegant and commodious houses of recent erection, and the town has, on the whole, been much improved, and is well adapted for a watering-place. East of D., on the chalk cliffs, 320 feet high, is Dover Castle, a formidable collection of works, which, begun in Roman times, have since that period been at intervals enlarged and strengthened, and although not yet complete, it occupies 35 acres within the walls, and includes tower forts and underground works; a bomb-proof magazine; a well 300 feet deep; barracks for 2000 men, excavated in the chalk, with a subterranean passage to the town down 420 steps; and keep 108 by 128 feet, with walls 24 feet thick, and turret 468 feet above the sea. There are batteries on the heights west of the town, the fortifications of which are being much strengthened and enlarged. Between Folkestone and D., the South-eastern Railway, within three miles of D., is tunnelled 1¼ mile through Abbot's Chalk Cliff, and nearly one mile through Hay or Shakspeare Chalk Cliff, which is 350 feet high. Between these tunnels, in 1843, a mass of chalk, 300 feet long, 375 feet high, and 70 thick, was removed by blasting with a charge of 80 barrels of gunpowder. The harbour of D. is now protected by a splendid stone pier, called the 'Admiralty' Pier, built of solid masonry, 60 feet in width, and which, when completed, will extend 1800 feet into the sea. D. is the chief port of communication between England and the continent; steamers constantly ply between it and Calais and Boulogne. D. imports eggs, fruit, and other rural produce from France. Pop. (1861) 24,970. D. returns two members to parliament. Julius Cæsar made his first attempt to land in Britain at Dover. It was the Roman *Dubris*, with walls and gates, and at the end of the Roman Watling Street. Edward the Confessor made D. one of the Cinque Ports, to guard the coast. It was early reckoned the key of England, and fortified. The Conqueror burned it. Here King John submitted to the pope. The French twice besieged Dover Castle, and the Parliamentarians held it in the Civil War. The military works of Dover Castle were increased in 1745, and again when Bonaparte threatened to invade Britain. The first submarine cable telegraph was laid from D. to Calais in 1850; there is now another to Ostend. The Corporation have lately, at great expense, restored the ancient hospital of the Maison Dieu, and converted it into a town-hall. In 1860, 1362 vessels, of 120,281 tons, entered and cleared the port.

**DOVER**, Strait of (*Fretum Gallicum, Pas de Calais*), the narrow sea-channel between England and France, and connecting the English Channel and North Sea. It is 18 to 25 miles broad, average 22, and 6 to 29 fathoms deep, but at Warne and Ridge Shoals only 1½ to 4 fathoms. The English side of the strait consists of chalk cliffs 300 to 600 feet high, succeeded on the south by lower greensand. The French side, from Calais to Cape Grisnez, has a similar succession of strata. The tides of the English Channel and North Sea meet in Dover Strait. Britain and the continent of Europe seem to have been once united across Dover Strait by an isthmus.

**DO'VERON**, or **DE'VERON**, a river of the north-east of Scotland, rising in the west of Aberdeenshire, a little south of the Buck of the Cabrach (2377 feet high). It runs 55 miles north-east, or 36 in a straight line, through adjacent parts of the counties of Aberdeen and Banff, and partly dividing them, past Huntly to the North Sea at Banff. It drains a basin of 410 square miles, composed of syenitic greenstone, metamorphic rocks, graywacke and old red sandstone.

**DOVER'S POWDER** is a preparation of powder of ipecacuanha 1 drachm, opium in powder 1 drachm, and sulphate of potash 1 ounce. The whole is thoroughly mixed, and the ordinary dose is from 5 to 10 grains. Occasionally, saltpetre is added. It is a most valuable medicine, and acts as a sudorific, increasing the proportion of sweat or sensible perspiration. In feverish conditions, where there is the dry furred tongue, and the dry skin, and the brain out of order, Dover's powder is reckoned to prove injurious; but where the tongue is moist, the skin moist and soft, and the brain comparatively unaffected, Dover's powder is of great service.

DO'VRE FJELD. See Scandinavia.

**DOW, DOU**, or **DOUW**, Gerard, one of the most exquisite of all the Dutch *genre*-painters was born at Leyden in 1613. He received his first instructions in drawing from one Dolendo, a draughtsman, and at the age of 15 entered the school of Rembrandt. That marvellous genius for colour which the latter possessed, fascinated the young painter, who soon shewed a similar mastery over *chiaroscuro*, but at the same time developed artistic qualities of a wholly different kind from those of his master. The most insignificant incidents of daily life were precious to D., and were delineated with a delicacy, neatness, and care, that could not be surpassed. In his workshop, the utmost cleanliness prevailed. D. was true to nature in a degree positively wonderful. The richness, transparency, vigour, and harmony of his colouring are beyond all praise. In consequence, his pictures, though generally small in size, are considered gems of art, and have brought astonishing prices. One of his best works, 'The Dropsical Woman,' is valued at 30,000 guilders. Among his other pieces may be mentioned 'The Village Grocer,' 'The Dutch Cook,' 'The Mountebank,' 'The Fiddler,' 'The Dentist,' and 'The Interior of a Household.' His works, which are pretty numerous, are in all the great European collections. D. died at Leyden in 1680.

**DOW'AGER** (Fr. *douairière*, from *douaire*, dowry, dower, derived from the Greek and Lat. *dos*, a thing given, verb *do*, to give), a widow with a Dower (q. v.); but commonly the title is applied only to the widows of persons of high rank. The queen-dowager, as the widow of the king, enjoys most of the privileges which belonged to her as queen-consort. But it is not high treason to conspire her death, because the succession to the crown is not thereby endangered. Still no man can marry a queen-dowager without special licence from the king. Though an alien born, the queen-dowager is entitled, by the common law, to dower after the king's death, though it was not till recently that this privilege belonged to the alien widow of a subject. A queen-dowager, though she should marry a subject, does not lose her regal title, as peeresses-dowager, when commoners by birth, lose their peerages when they marry commoners.

**DOWER** (Lat. *dos*, in Domesday, *Maritagium*), 'in the common law, is taken for that portion of lands or tenements which the wife hath for terme of her life of the lands or tenements of her husband after his decease, for the sustenance of herselfe, and the nurture and education of her children.'—*Coke upon Litt.* 30 *b.* Formerly, a widow's right to dower was protected by the law, and could only be defeated by certain prescribed means; but by 3 and 4 Will. IV. c. 105, a husband, by simple conveyance of his land, or by burdening it with debt, may defeat the right of his widow to dower. He may effect the same purpose by introducing into the deed of conveyance to himself, or into his last will and testament, a simple declaration of his intention to bar his widow's right of dower. Though the right of dower has thus lost much of its importance, the history of this right forms an interesting chapter in the English common law. In feudal times, when personal property was small, a widow depended almost exclusively on her right to dower for maintenance after her husband's death. Three things, says Lord Coke, 31 *a*, were necessary for dower—marriage, seisin, and the death of the husband. The usual amount of dower was a third of the land in which the husband died seised; but, by custom, as Gavelkind (q. v.), it amounted sometimes to a half, and in certain cases to the whole.—*Litt.* s. 37. Besides dower at common law, and dower by custom, three other species of dower are noticed by Littelton—viz., *dower de la plus belle*, s. 47; *dower ad ostium ecclesiæ*, s. 39; and *dower ex assensu patris*, s. 40. The first of these was where a man died possessed of lands held partly by Knight's Service (q. v.), and partly by Socage (q. v.), leaving a child under 14, the widow could be compelled, as guardian in socage, to take her dower out of the socage lands. This species of dower fell with the military tenures by 12 Car. II. c. 24. The last two species of dower mentioned above were both made at the time of the celebration of the marriage. *Dower ad ostium ecclesiæ* was when the husband, being of full age, at the church door specially endowed his wife in the whole or a part of his lands. In *dower ex assensu patris*, the bridegroom's father being alive, the same form was observed, with the sanction and consent of the father. In both of these cases, the widow was entitled, on death of her husband, to enter at once upon the land without any assignment. These species of dower were abolished by 3 and 4 Will. IV. c. 105, s. 13. In dower at common law, and dower by custom, which are still suffered to exist, a widow cannot enforce her claim until certain lands have been assigned to her for her dower by the heir or by writ of the sheriff.—*Co. Litt.* 34 *b.* In early times, it was necessary to pay a duty to the lord for this assignment, but this exaction was abolished by Magna Charta. In its general principles, the right to dower in England resembled the right of Terce (q. v.) in Scotland. In both countries, the amount allowed by law was a third of the husband's lands, and in both a certain process was necessary before the widow could enforce her right. A woman forfeits her right to dower by eloping from her husband (13 Edw. I. c. 34), by the treason of her husband, by divorce *a vinculo*, but not by divorce *a mensa et thoro.* The right to dower was also barred by levying a Fine (q. v.) of lands, by conveyance to uses in bar of dower, and by the settlement of a jointure upon the wife. See FINE, JOINTURE.

**DOW'LAS**, a kind of coarse strong linen, used by working-people for shirts, and manufactured largely at Knaresborough in Yorkshire, at Dundee, and at Newburgh and other places in Fifeshire. Since the introduction of calico, the home demand for dowlas has very much diminished, the article being little used except in the iron districts. The principal exports of dowlas are to Spain, and the countries inhabited by peoples of Spanish origin, in North and South America.

**DOWLATABA'D** (in English, *Abode of Prosperity*), a strongly fortified town of Hindustan, within the Nizam's dominions, near their north-west frontier, in lat. 19° 57′ N., and long. 75° 18′ E. The town is commanded by a rock-fortress, which, with a height of about 500 feet, is scarped into a perpendicular for the lowest third of the altitude. This stronghold is all the more formidable from its being completely isolated, being fully 3000 yards distant from any other eminence. The town of D. has recently greatly decayed, and only a small portion of it is now inhabited.

**DOWN**, a maritime county in the south-east of Ulster Province, Ireland. It is 51 miles long, and 38 broad, with an area of 967 square miles, $\frac{5}{6}$ths being arable, and $\frac{1}{300}$ in wood. It has a coast-line of 67 miles, or 125 by the inlets, mostly low and rocky, and with many isles off it. The chief inlets are Belfast Lough, or Carrickfergus Bay, 3 miles broad, and 15 deep; Strangford Lough, $\frac{1}{2}$ to 3 miles by 10, with many isles on which are old castles and abbeys; Dundrum and Carlingford Bays. The Mourne Mountains cover 90 square miles in the south, and rise 2796 feet in Slieve Donard. The other parts of D. are mostly undulating and hilly, with plains and fine meadows along the rivers. The chief rocks are Lower Silurian—covering most of the county—and granite, composing the Mourne and Croob mountains. The chief rivers are the Upper Bann and the Lagan. The Newry Canal, which connects Carlingford Lough with the Bann, and thus with Lough Neagh, admits vessels of 50 tons, and with the Ulster Canal opens communication through almost all Ulster. Marl beds, five feet thick, occur in morasses and alluvial tracts. The soils are chiefly stony and clayey loams. In 1858, nearly half the county was in crop. The chief crops are oats, potatoes, turnips, wheat, flax, and barley. Many pigs are reared. The chief manufacture is linen, especially the finer fabrics, as muslin, woven in the houses of the small farmers. Hosiery, leather, salt, thread, and woollens are also made. These, with corn, butter, pork, and hides, are the chief exports. D. is among the best cultivated of the Irish counties, and has more resident gentry (almost all Protestants, of English and Scotch descent) than any other Ulster county. It contains 11 baronies, 5 poor-law unions, and 70 parishes. The chief towns are Downpatrick, Newry, Newton-Ardes, Bainbridge, and Donaghadee. D. sends four members to parliament. Pop., 1851, 320,817; 1861, 299,866. Presbyterianism prevails in the towns and low country, and Roman Catholicism among the mountains. D. has many ancient remains, as raths, cromlechs, round towers, castles, and abbeys. On the top of Slieve Croob (1755 feet high) are 23 stone cairns, one being 54 feet high, and 77 yards circuit at the bottom, and 45 at the top. D. was part of the ancient principality of Dalriada (q. v.).

**DOW'NHAM MARKET**, a town in the west of Norfolk county, on a hillside, on the right bank of the Ouse, 40 miles west of Norwich, and $10\frac{1}{2}$ south of Lynn Regis. It lies amid fen and dairy land. Pop. about 3000. It has a bell-foundry, and a celebrated butter-market. By the Ouse and Cam, vessels proceed from Lynn on the coast to Cambridge, 30 miles above Downham Market. A market was confirmed here in the time of Edward the Confessor. D. M. had once a Benedictine priory.

**DOWNPA'TRICK** (Mount of Patrick), or **DOWN**, a maritime town, parliamentary and municipal burgh, and cathedral city, in the south of

Down, of which it is the county town. It is situated near the mouth of the Quoyle, which flows into the south-west end of Lough Strangford, 74 miles north-north-east of Dublin, and 21 miles south-south-east of Belfast. It has many public buildings, and four main streets meeting in the centre. It is divided into English, Irish, and Scotch quarters. The diocesan cathedral was restored in 1790 on the site of one built in 1412, and burned in 1538 by Lord Deputy Grey. Vessels of 100 tons reach the quay a mile from Downpatrick. It has manufactures of linen, soap, leather, and malt liquors. Pop. (1861) 3685. It sends one member to parliament. To the north-west of D. are the remains of great earthworks, ¾ mile in circuit, enclosing a conical rath 60 feet high and 2100 in circumference. D. is said to be the oldest city in Ireland, and was famous long before the arrival of St Patrick, who founded religious establishments here. D. was burned by Edward Bruce in 1315, and plundered by O'Neil in 1552. The four holy wells of Struel or St Patrick, 1½ mile east of D., where stood St Patrick's monastery, are resorted to by Roman Catholic pilgrims from all Ireland.

**DOWNS, The**, an important roadstead or shelter for shipping, off the south-east coast of Kent, opposite Ramsgate and Deal, between North and South Foreland, and protected externally by the Goodwin Sands—a natural breakwater with one to four fathoms water, and often partly dry at low tide. This large natural harbour of refuge is eight miles by six, with an anchorage of four to twelve fathoms, but having many sands and overfalls partly or wholly dry at low water. It is resorted to temporarily by outward and homeward bound vessels, and squadrons of ships of war, and is unsafe only in south winds. It is defended by Deal, Dover, and Sandown Castles.

**DOWNS** (Ger. *dünen*, Fr. *dunes*, from the root *dun* (q. v.), common to the Gothic and Celtic languages, signifying a *hill*), a term usually applied to hillocks of sand thrown up by the sea or the wind along the sea-coast. It is also a general name for any undulating tract of upland too light for cultivation, and covered with short grass. It is specially applied to two broad ridges of undulating hills south of the Thames, beginning in the middle of Hampshire, and running eastward, the one (the North D.) through the middle of Surrey and Kent to Dover (about 120 miles), and the other (the South D.) through the south-east of Hampshire and near the Sussex coast to Beachy Head (about 80 miles). Between the two ranges lies the valley of the Weald (q. v.), from which the chalk strata are supposed to have been removed by denudation. Towards the Weald, the descent from both D. is rapid, and presents cliffs as of a sea-margin; while the opposite slopes are gradual. The highest point of the North D. is Botley Hill, 880 feet; and of the South D., Ditchelling Beacon, 858 feet. These uplands are covered with fine short pasture, which, from its aromatic quality, forms excellent feeding-ground for the famous South Down sheep. The valleys occurring among the hills are usually fertile, and admit of cultivation, so that an excellent field is furnished for mixed husbandry. By pasturing the sheep on the D. during the day, and folding them on the arable fields at night, the latter are highly fertilised.

**DO'WNTON**, a town in the south-east of Wiltshire, on the right bank of the Avon, here split into three branches, six miles south-east of Salisbury. It chiefly consists of one long street with the houses irregularly placed. Pop. (1861) 3581. It has a paper-work, and an ancient cross. D., in the middle ages, had a castle, of which the mound or moat remains, and is a singular earthwork, on which Saxon justice was dispensed. Two miles north of D. is the mansion and estate of Standlinch, the national gift to the heirs of Lord Nelson, for which parliament voted £100,000.

**DOXO'LOGY**, a Greek word, signifies an exclamation or prayer in honour of the majesty of God, such as Paul uses at the close of his epistles, and sometimes even in the middle of an argument (Romans ix. 5). The hymn of the angels (Luke ii. 14) is also called a doxology by the Christian Church; so likewise is the close of the 'Lord's Prayer.' The so-called 'Great Doxology' is simply an expansion of the angelic hymn, and is sung in the Roman Catholic Church at the celebration of the Lord's Supper, and at matins. It commences with the words, *Gloria in excelsis Deo* ('Glory to God in the highest'). The ordinary doxology, 'Glory be to the Father, Son, and Holy Ghost, as it was,' &c., is repeated at the end of each psalm in the service of the Church of England; there is a similar doxology in verse to suit different metres.

**DOYLE, Richard**, son of the celebrated caricaturist H. B., whose name was John Doyle, was born in London in 1826. He became a contributor to *Punch*, and furnished its pages with the well-known sketches of 'Ye Manners and Customs of ye English.' In 1850, his connection with that publication ceased, and since that period he has employed himself in the illustration of books. Among his works of this nature may be mentioned the *Adventures of Brown, Jones, and Robinson*, and the illustrations to the *Newcomes* and the *Scouring of the White Horse*. At present (1861), he is supplying 'Sketches of Modern Society' to the pages of the *Cornhill Magazine*, which are distinguished, like everything from his pencil, by the most genial humour, and the most graceful drawing.

**DOZY, Reinhart**, one of the most learned orientalists of the present day, was born 21st February 1820, at Leyden. He belongs to a family of French origin, which settled in Holland after the revocation of the Edict of Nantes. He studied at the university of his native town, and devoted himself to philological and historical, but especially to oriental studies. In 1844, he took his degree of doctor, and in 1850 was appointed extraordinary professor of history at Leyden. Apart from his lesser writings in the *Journal Asiatique* and other periodicals, which, however, exhibit the profoundest knowledge of the Arabic tongue and literature, D. has published *Dictionnaire détaillé des Noms des Vêtements chez les Arabes* (Amst. 1845), *Historia Abbadidarum* (Leyden, 1846—1852), and editions of Abdo'l Wâhid al Marrêkoshi's *History of the Almohades* (1847), of Ibn-Badrun's *Historical Commentary on the Poem of Ibn-Abdun* (1848), with introduction, notes, glossary, and index, and of Ibn-Adheri's *History of Africa and Spain* (1848—1852). In 1849 appeared what is probably his most masterly performance, *Recherches sur l'Histoire politique et littéraire de l'Espagne pendant le Moyen Age*. A second edition enlarged and completely recast, was published in 1860. In this work, D. has exposed, with admirable good sense and enlightened criticism, the gross and wilful corruptions of the monkish chroniclers, who persisted in falsifying history for the benefit of Christianity, and who could form no more rational idea of the Moors than that they were 'devils,' or abetted by the devil, and sent to torment them because of their *sins*. The passages devoted to Count Julian and the Cid are worthy of the highest praise.

**DRA'CHENFELS** ('Dragon's Rock'), a mountain on the Rhine, one of the range called the

*Siebengebirge*, is renowned through Byron's verses commencing

> The castled crag of Drachenfels
> Frowns o'er the wide and winding Rhine.

It is situated on the right bank of the river, about eight miles south-east of Bonn, and has an elevation of 1056 feet. It is of volcanic origin, consisting of lava, trachyte, and basalt. D. rises abruptly from the river, and is covered with brushwood almost to the top, whence the prospect is magnificent, extending down the river as far as Cologne, and having a charming foreground in Bonn, with its university, and numerous villages, and time-worn castles. The cave where the dragon—from which the mountain takes its name—was wont to abide, is pointed out to the traveller. The ruins of an old castle crown the summit, and add picturesqueness to the Drachenfels.

**DRA'CHMA, DRACHM, DRAM.** The drachma was a silver coin, the unit of the money-system in ancient Greece. It varied in value in different parts of Greece and at different times. The Attic drachma is estimated as equivalent to $9\frac{3}{4}$*d.* of our money—very nearly a French franc. The Æginetan drachma was considerably more. But whatever its absolute worth, it always remained the 6000th part of the *talent* (about £244), and the 100th part of the *mina* (about £4), and was divided into six obols. There were also coins of two, three, and four drachmas. The drachma (originally *a handful*) was also the name of a weight, and 100 drachmas made a mina, in weight, as in money. The weight of the drachma is stated at from $\frac{1}{4}$ oz. avoirdupois to little more than half as much. At this lowest estimate, the mina = 1 lb. nearly. The unit in the monetary system of modern Greece, since 1833, has also been called *drachma;* it is equivalent to $\frac{88}{100}$ of a franc, or about $8\frac{1}{2}$*d.* sterling, and is divided into 100 lepta. In the British system of weights, there are two drachms or drams: the avoirdupois *dram*—equal to $27\frac{11}{32}$ troy grains—and the apothecaries' *dram*, equal to 60 troy grains, or $\frac{1}{8}$ of an ounce troy. It is this last which is the representative of the ancient drachma.

**DRACO** (Gr. *Drakon*), an Athenian lawgiver and archon, who, in the year 624 B. C., was appointed to draw up new laws for the disordered state. These, however, effected little change in the form of the state; but by being committed to writing, put an end to the arbitrary administration of justice on the part of the archons, and resulted in the establishment of a court of appeal—that of the Ephetæ. D.'s legislation had a beneficial and permanent effect upon the political development of Athens. The extraordinary severity of these laws, however, which punished the slightest theft, or even laziness, with death, no less than sacrilege, murder, and treason, caused them to be often neglected, and made them so hated, that Solon was appointed to draw out a new code. Solon, though he softened their severity in most instances, retained that law which punished a murderer with death. D., at a later period, went to Ægina, where, after having introduced his laws, he is said to have been stifled in the theatre by the garments thrown upon him as a mark of respect by the people. The severity of his laws gave rise to a pun by Herodicus, who declared that D.'s laws were those of a dragon (Gr. *drakon*) and not of a man. Hence also originated the metaphorical remark of Demades, 'that they were written not in ink but in blood.' Extremely severe and sanguinary laws are still called *Draconic.*

**DRA'CO,** a constellation in the northern hemisphere. The star $\gamma$ Draconis is celebrated as the one used in determining the co-efficient of aberration of the fixed stars. It is a bright star, nearly in the solstitial colure, and consequently the minor axis of the small ellipse which its apparent place describes in the heavens, lies in the meridian at its transit. Moreover, at the two equinoxes, when its apparent place is at the extremities respectively of this minor axis, it can be observed on the meridian at one equinox about sunrise, and at the other about sunset, so that both observations may be made without the interference of a too bright daylight. These two observations, therefore, are easily taken, and the difference in the north polar distance which they give, is the minor axis of the ellipse described by the apparent place of the star.

**DRACO'NTIUM,** a genus of plants of the natural order *Araceæ*, of which one species, *D. polyphyllum*, a native of Guiana, Surinam, and also of India and Japan, has a powerful action on the nervous system, and is useful in asthma; although at present its chief reputation is the somewhat doubtful one of curing the bite of a snake, to which its mottled stem gives it some resemblance. The flower, when it first expands, emits an intolerable stench.

**DRAFT,** an order addressed to a debtor by his creditor, calling upon him to pay a certain sum either to the drawer or to a third party. See BILL, CHEQUE.

**DRAFT,** or **DRAUGHT,** a tentative copy of a legal document, or other formal writing, made for the purpose of adjusting the matter afterwards to be admitted into the fair copy, or engrossed, as it is called. Manuscripts and proof-sheets are the drafts of printed works.

**DRAG,** a mechanism for slackening the speed of carriages, by operating on one or more of the wheels. The form of drag best known to old travellers by coach is that of the 'shoe,' a hollow piece of iron attached by a chain to the carriage, which being put below one of the hind wheels partially reduced the vehicle to the quality of a sledge; by which dragging process the carriage was suitably retarded on going down-hill. As the shoe-drag required to be applied and removed with some inconvenient detention of the vehicle, a step was made in advance when a method of retarding a wheel without detention was discovered. This new process, which is known as the patent drag, consists of a connected piece of mechanism, altogether operated upon by the driver without moving from his seat. A handle affects a series of rods and levers by which a species of shoe is pressed against one of the wheels, so as to slacken its motion. Such is the kind of drag now very generally attached to gentlemen's travelling-carriages, omnibuses, and other vehicles for passengers on the roads of Great Britain. It is of French origin. Applied in either form, the use of the drag, independently of its safety, is to allow horses to continue running at ordinary speed down-hill, without being unduly pressed on by the carriage behind them. A similar contrivance, but of a more powerful kind, called a *break* or *brake*, is applied to arrest the motion of railway-trains. See RAILWAYS.

**DRA'GOMAN,** from the Turkish *trukĕman*, the general name given in Turkey to an interpreter, or to a guide to foreigners. The common dragoman corresponds exactly to the Italian *cicerone*, or the French *commissionaire* or *valet de place.* There are several connected with the hotels at Constantinople and other Turkish cities, who pounce eagerly upon European travellers, to perform every imaginable service. The diplomatic dragomen are, however, important personages, being the medium of communication between the Christian ambassadors and the Sublime Porte. Though usually natives, they and their families enjoy the privilege of being under the protection of the embassy they serve, and are subject to the laws of the country of that embassy, and not to the Turkish law. This privilege, which is also enjoyed by all the subjects of the great Christian powers resident in Constantinople, &c., is much valued, on account of the greater severity of the Turkish laws, and the summary manner in which they are executed. These dragomen are mostly of Italian extraction, either descendants of the old Genoese and Venetian merchants or Maltese. Strange stories are told of their tricks in garbling the communications they have to make, when private interests can be served by such means, and bribes obtained; and there is no doubt that newly appointed consuls, quite ignorant of the Turkish language, are in some respects almost completely in their power, and that this power is frequently used very unscrupulously.

**DRAGON**, a name applied in modern natural history, both popularly and by scientific authors, to different kinds of saurian reptiles. Some of these (the genus *Draco* of Linnæus) are remarkably characterised by false ribs extending from the sides, so as to support a membrane which is used as a parachute. These are called Flying Dragons (q. v.). or Flying Lizards. Another reptile which has received the name D., and is also called D. Lizard (*Ada*), belongs to a family of saurians, *Teyidæ*, found only in America, closely allied to the *Varanidæ* of the Old World, and to which, in common with them, the names Monitor and Safeguard have sometimes been given, in consequence of their being supposed—although erroneously—to give warning by a hiss of the proximity of a crocodile or alligator. It inhabits the marshy plains of Guiana, climbs trees with facility, bites severely, has a long compressed tail, the back and tail crested, the tongue forked like that of a serpent, and attains a length of about six feet. Both its flesh and eggs are used as articles of food.

Fringed Dragon (*Draco fimbriatus*).

**DRA'GON.** In the mythical history and legendary poetry of almost every nation, the D. appears as the emblem of the destructive and anarchic principle, as it manifests itself in the earlier stages of society—viz., as misdirected physical power and untamable animal passion. Like the serpent, the D. is always a minister of evil, of the principle which aims at negation, opposition, and contradiction, the object of which is to fight against order, harmony, and progress. But whilst the serpent seeks the attainment of its object by cunning and deceitful artifices—crawling on its belly, and always assuming ostensibly characteristics the very opposite of its own—the D. proceeds openly to work, running on its feet, with expanded wings, and head and tail erect, violently and ruthlessly outraging decency and propriety, spouting fire and fury from both mouth and tail, and wasting and devastating the whole land. The destruction of this disorderly element was one of the first objects of human energy, but it was an object which was unattainable by merely human means, and mankind were accordingly indebted for its accomplishment to that intermediate class of beings known as heroes in classical antiquity. As the highest ideal of human strength and courage, the task properly fell to Hercules; but it was not confined to him, for we find both Apollo and Perseus represented as dragon-slayers. From legendary poetry, the D. passed into art, some of the earliest efforts of which probably consisted in depicting it on the shield, or carving it for the crest of a conqueror's helmet. The D. does not seem to have been a native emblem with the Romans, and when they ultimately adopted it as a sort of subordinate symbol, the eagle still holding the first place, it seems to have been in consequence of their intercourse with nations either of Pelasgic or Teutonic race. Amongst all the new races which overran Europe at the termination of the classical period, the D. seems to have occupied nearly the same place that it held in the earlier stages of Greek life. In the *Nibelungen Lied*, we find Siegfried killing a D. at Worms; and the contest of Beowulf (q. v.), first with the monster Grendel, and then with the D., forms the principal incident in the curious epic which bears the name of the former. Even Thor himself was a slayer of dragons (J. Grimm, *Deutsche Mythologie*, ii. 653). Among the Teutonic tribes which settled in England, it was from the first depicted on their shields and banners; and Dr Plott, in his History of Oxfordshire, ascribes the origin of the very ancient custom of carrying the D. in procession at Burford, in great jollity, on Midsummer Eve, to the fact of a banner adorned with a golden D. having been taken by a king of the West Saxons from a king of Mercia. The custom, however, is

St George for merri England

St George and the Dragon.

said by Brand, on the authority of Aubanus, to have prevailed in Germany, and was probably common in other parts of England (Brand's *Pop. Antiq.* i. 321). Nor was the D. peculiar to the Teutonic races. Amongst the Celts, it was the emblem of sovereignty, and as such borne as the sovereign's crest. Mr Tennyson's *Idylls* have made every one familiar with 'the dragon of the Great Pendragonship,' blazing on Arthur's helmet, as he rode forth to his last battle, and 'making all the night a stream of fire.'

The fiery D., or Drake, and the flying D. in the air, were meteoric phenomena, of which we have frequent accounts in old books, and, indeed, as Brand remarks, 'the dragon is one of those shapes which fear has created to itself,' and which appears in circumstances, and clothes itself in forms, as various as our fears.

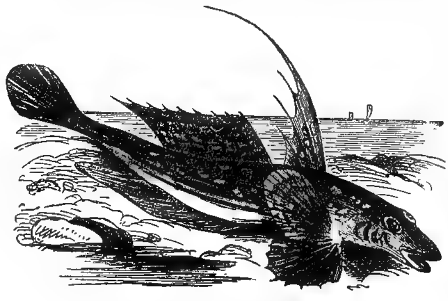
In Christian art, the D. is the emblem of sin, the usual form that is given to it being that of a winged crocodile. It is often represented as crushed under the feet of saints and martyrs, and other holy personages. Sometimes its prostrate attitude signifies the triumph of Christianity over paganism, as in pictures of St George and St Sylvester; or over heresy and schism, as when it was adopted as the emblem of the Knights of the order of the D. in Hungary, which was instituted for the purpose of contending against the adherents of John Huss and Jerome of Prague.

The D. is often employed in heraldry; and other animals, such as the lion, are sometimes represented with the hinder parts resembling dragons. An animal so represented is said to be *dragonné*. See GRIFFIN. A D. without wings is called a lindworm, or lintworm, which Grimm (*Deutsche Mythol.* ii. 652) explains to mean a beautiful or shining worm.

**DRAGON**, GREEN (*Dracunculus vulgaris*), a plant of the natural order *Araceæ*, which receives its name from its spotted stem. It is a native of the south of Europe. Its flowers are black, remarkably fetid, and give out exhalations which cause headache, giddiness, and vomiting. The root is emetic, and, probably for no better reason than the peculiar appearance of the stem, has been supposed useful for curing serpent-bites.

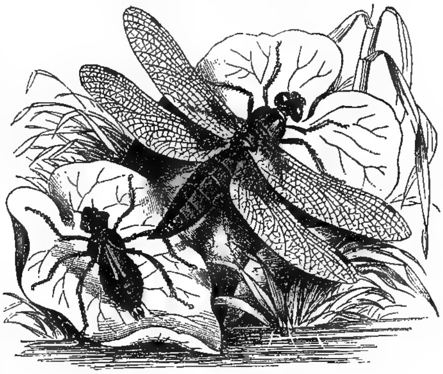
**DRAGON ROOT** (*Arisæma atrorubens*, formerly *Arum triphyllum*), a plant of the natural order *Araceæ*, a native of North America, the tuber of which is a powerful local irritant, and is used as a stimulant of the secretions in chronic bronchitis, asthma, rheumatism, &c. The powder, made into a paste with honey, is beneficially applied to the mouths and throats of children in aphthæ; and milk, in which the root has been boiled, is a useful ointment in cases of scalled head, ringworm, &c.

**DRAGONET** (*Callionymus*), a genus of fishes of the Goby (q. v.) family (*Gobiadæ*), remarkable for having the gill-openings reduced to a small hole on each side of the nape, and the ventral fins placed under the throat, separate, and larger than the pectorals. They have no air-bladder. The species are pretty numerous; most of them finely coloured, as the GEMMEOUS D. (*C. lyra*) of the British coasts—called *Gowdie* (*gowd*, gold) in Scotland—a fish about ten or twelve inches long, the prevailing yellow colour of which is varied with spots of sapphirine blue, &c.



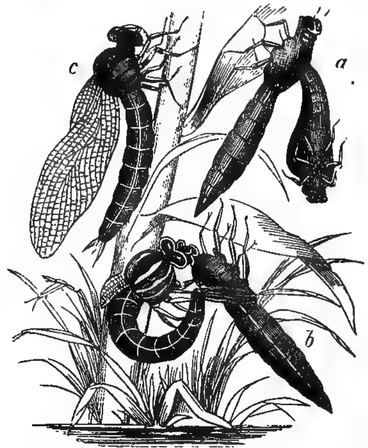
Gemmeous Dragonet (*Callionymus lyra*).

**DRAGON-FLY** (*Libellula*), a Linnæan genus of neuropterous insects, now constituting the family *Libellulidæ*. They are in general very beautiful, rivalling butterflies in their hues, and like them loving the sunshine. They are, however, easily distinguished from butterflies, even at a distance, by their more slender form and comparatively narrow gauze-like wings; and differ from them still more widely in their habits, as they do not feed on the nectar of flowers, but prey on other insects, which they pursue with rapid flight. Dragon-flies have a large head; the mouth is formed for mastication, and its parts, especially the mandibles, possess great strength.—See the article COLEOPTERA for an explanation of the structure of the mouth in *masticating* insects, and the names of its parts.—The antennæ are short, awl-shaped, and of few joints. The eyes are large, lateral, and projecting. The wings—four in number—are equal in size, or nearly so, long, very thin, and very much reticulated. The legs are short. The abdomen in some is compressed, in others slender and cylindrical, in some remarkable for its extreme slenderness. The French name *demoiselle*, given to these insects, seems to be due to their beauty. They are, however, equally remarkable for their voracity. The Great D. (*Aeshna grandis*), an insect about four inches long, the largest of the British species, has been seen to dart upon a large cabbage-butterfly which passed as it was flitting up and down in search of prey; and then settling on a twig, it bit off the wings, and in less than a minute devoured the body.



Dragon-fly and Nymph (*Libellula depressa*).

Dragon-flies are usually most abundant in the vicinity of lakes, rivers, and marshes. They deposit their eggs in water, and the larvæ and pupæ are entirely aquatic, living chiefly at the bottom of the water, and creeping on the submerged parts of aquatic plants. They are as ravenous as the perfect insect, which in general form they pretty much resemble; aquatic insects are their food. The pupæ, unlike those of the greater number of insects, are active. They are provided with the means of drawing water into their bodies to supply air for respiration, and expel it again by the same orifice at the extremity of the abdomen, with such force, that they thus propel themselves through the water, whilst their legs are at rest. When the final transformation is about to take place, the D. pupa crawls out of the water on a stick, rush, or other object; fixes itself by hooks, with which its legs are furnished; and the skin then splitting at the back, the perfect insect comes forth, but with body and wings quite soft and moist, and the wings still folded up into small compass. In the sub-family of *Agrionidæ*, the wings are elevated vertically in repose: in the true *Libellulidæ* (*Libellula, Aeshna*, &c.), they are extended horizontally.



Dragon-fly, Transformation from Pupa to Perfect Insect:

*a*, perfect insect, half protruded from the pupa-case; *b*, same, just emerged; *c*, perfect insect nearly ready for flight.

Dragon-flies extend even into very northern regions, but are most abundant in warm climates.

**DRAGONNA'DES**, the name applied to a series of religious persecutions which took place in France in the reign of Louis XIV. and that of his successor, and which were intended to compel the Protestants of that country to renounce their religion. They consisted of armed expeditions, led by a bishop, an intendant, a sub-delegate, or a priest, who marched through the provinces, demanding of the heretics that they should abjure their faith, and leaving such as were refractory to be dealt with by the unscrupulous troops. Foremost among the armed force rode dragoons, who, from the fact of their taking the precedence, and also from the merciless treatment to which they subjected the Protestants, had the unenviable honour of giving a name to the persecutions. Louis XIV., who had been entirely misinformed as to the means employed in the D. by the courtiers and fanatics who surrounded his throne, was delighted to find that from 250 to 400 Protestants were daily being received into the bosom of the church, and in consequence, on the 22d October 1685, a few months after the date of the first of the D., he revoked the Edict of Nantes (q. v.), that the good work might be fully accomplished.

**DRAGON'S BLOOD**, sometimes called Gum Dragon, an astringent, resinous substance, obtained from several trees of different natural orders, natives of warm countries. The greater part of the D. B. of commerce is probably the produce of *Pterocarpus Draco*, a large South American tree of the natural order *Leguminosæ*, sub-order *Papilionaceæ*, which at some seasons appears as a magnificent mass of yellow blossom. A similar substance is yielded in the East Indies, by the Red Sandal-wood tree (*Pterocarpus santalinus*); and *Dalbergia monetaria*, a tree of the same order, yields it in Guiana. Mexican D. B., used in Mexico as a vulnerary and astringent, is obtained from *Croton Draco* (see CROTON), of the natural order *Euphorbiaceæ*. The best kind of all is supposed to be produced by *Calamus Draco*, an East Indian palm, and part of it is said to be obtained from the fruit of the palm.—D. B. exudes from the surface of the leaves, and from cracks in the stem of the DRAGON TREE (*Dracæna Draco*), a tree of the natural order *Liliaceæ*, remarkable for the size which it sometimes attains, rivalling even the baobab, and of which a celebrated specimen near Orotava, in the island of Tenerife, was found by Humboldt in 1799 to have a stem about 45 feet in circumference, and is described as having been of similar gigantic size in the beginning of the 15th century. The stem of the dragon tree is, however, generally short in proportion to its thickness, and its head consists of numerous short branches, terminating in tufts of sword-shaped leaves. It is not supposed to yield any of the D. B. of commerce.

Dragon Tree (*Dracæna Draco*).

D. B. is opaque, of a deep reddish-brown colour, brittle, smooth, with a shining shell-like fracture, and when burned, emits an odour resembling that of benzoin. It is nearly insoluble in water, but is soluble in alcohol, and the solution will permanently stain heated marble, for which it is often used, as well as for staining leather and wood. It is also soluble in oils and turpentines, and enters into the composition of brilliant and much-esteemed varnishes. It was formerly employed in medicine, but is now almost out of use.—An astringent resin obtained from the *Eucalyptus resinifera* of New Holland is there called Dragon's Blood.

**DRAGON'S MOUTH**, or, in Spanish, BOCA DEL DRAGO, is the name of two straits or passages in the New World. One of them is in South America, separating Trinidad from the mainland, and connecting the Gulf of Paria with the south-east extremity of the Caribbean Sea. The other is in

Central America, being on the north-east coast of Veragua, the most north-westerly portion of New Granada, and it communicates between the Caribbean Sea and Lake Chiriqui.

**DRAGOO'N.** From the old fable that the dragon spouts fire, the head of the monster was worked upon the muzzles of a peculiar kind of short muskets which were first carried by the horsemen raised by Marshal Brissac in 1600. This circumstance led to their being called dragoons; and from the general adoption of the same weapon, though without the emblem in question, the term gradually extended itself till it became almost synonymous with horse-soldier. Dragoons were at one time a kind of mounted infantry, drilled to perform the services both of horse and foot. At present, *dragoon* is simply one among many designations for cavalry, not very precise in its application. In the British army, the *heavy* dragoons and the *light* dragoons are so nearly alike in the weight of the men, horses, and appointments, that the meaning of the distinction is nearly lost. The first dragoons in the army were the Scots Greys, established in 1683.

In the British army, there are at present seven regiments of 'Dragoon Guards,' and eighteen regiments of 'Dragoons.' See HORSE GUARDS.

**DRAGUIGNAN**, a town of France, in the department of Var, on a tributary of the Argens, about 40 miles north-east of Toulon. It is charmingly situated, in the midst of a valley surrounded by hills, the slopes of which are covered with vineyards and olive plantations. It is tolerably built; and its streets are adorned with numerous fountains and trees. Its principal structures are the prison, the court-house, a hospital, and a stately clock-tower. It has manufactures of coarse woollens, leather, hosiery, silks, soap, brandy, oil, and earthenware. Pop. 8827. D. is an ancient place. During the middle ages it was strongly fortified. The fortifications were destroyed in the civil wars, but were reconstructed in 1615.

**DRAINAGE**, in Husbandry, is the art of carrying off water from the soil and subsoil of land by means of open or closed drains or trenches—the term, however, is generally understood of closed drains. By its means, the fertility of wet land has been greatly increased. When the drains are put in every six or ten yards, it is called *furrow* or *frequent* draining.

The vast amount of capital which has been expended in drainage within a quarter of a century, attests its utility and necessity. Before the introduction of furrow-draining, stiff and tenacious clays were of comparatively little value. They were cultivated at much expenditure of labour, and the crops which grew upon them were influenced to a great extent by the variations of the seasons. A system by which wet and worthless land could be rendered dry and valuable, was an improvement so patent to practical men, that we need not wonder at its general adoption.

Drainage by open ditches was no doubt the first mode of freeing land from superfluous water. The Roman agricultural writers mention the good results arising from covered drains, which were formed of wood and other substances, which served so far to render the land dry. More than a century ago, a large extent of clay-land was drained at narrow intervals in Norfolk and Essex, by putting in brushwood and even straw in the bottom of the drains. The progress of draining, which is now regarded in many soils as essential to economic culture, was slow and partial, until Mr Smith of Deanston (about the middle of the 19th c.) reduced the practice to a system, and shewed the principles upon which its efficiency depended. Through the exertions of this advocate, furrow-draining soon became a *sine quâ non* in the culture of clay-soils, or indeed any soil, in most climates.

The great majority of practical men consider the line of greatest fall, or quickest descent, as the best for cutting drains in a field. This, it may be remarked, is also usually the direction for ploughing the land and forming the ridges; so that the drains are commonly put into the *furrows*, and hence the distinguishing appellation, *furrow-draining*. The smaller drains are usually conducted into larger or *main* drains, instead of each discharging its quota of water into the open ditch. This is rendered necessary, as the mouths of the smaller drains would be more liable to be choked up by the growth of weeds; while the collecting of water into main drains secures a fuller flow to sweep out any matters which might accumulate where the discharge was small.

The most efficient, and at the same time cheaply cut drain, is one represented at fig. 1. It is made so that a pipe of a cylindrical form may be laid along the bottom, which should be of no greater width than what is necessary to allow of the pipes being properly laid.

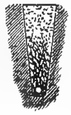


Fig. 1.

Drains of this form are cut with a set of spades which are of different widths—the broader being used for taking out the top, and the narrowest for the bottom. The one which cuts the last spit is called the *bottoming tool*, and its introduction has effected a considerable saving in cutting drains.

Before the general use of pipes, stones were the common materials with which drains were formed. Mr Smith recommended that they should be broken so small, that they might pass through a ring two inches and a half in diameter. From nine inches to a foot in depth was the quantity which was commonly put in. This was found to be a most efficient way of making drains; but unless the stones could be gathered from the fields, or quarried in the neighbourhood where they were used, an immense amount of labour was involved in filling them.

When tiles and pipes were first used, it was even thought necessary to have some gravel, or small stones, placed above them in the drains, for the purpose of enabling the water to find its way into them, as seen at fig. 2. It was soon found, however, that tile-drains were quite as efficient without any stones or gravel; and that they were less liable to be choked up, as the clay or earth acted as a filter in preventing the intrusion of any kind of solid matter.

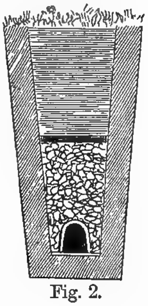


Fig. 2.

Many kinds of tiles and pipes have been tried, but the cylindrical form is now most used. At one time, a bore in the tile of an inch in diameter was thought sufficient, but two-inch tiles are now preferred. They are usually made about fifteen inches in length. The continuity of the drain is maintained completely by *collars*, which should always be used as a means for securing efficiency and permanency.

Much discussion has taken place in regard to the proper depth of drains, as well as the distance at which they should be placed. Mr Smith at first advocated the making of drains from two and a half to three feet deep, and at intervals of from ten to forty feet, according to the nature of the land. Experience, however, has been gradually favouring deeper drains, at wider intervals. Mr Parkes went the length of recommending a depth of from four to six feet, at intervals of from 24 to 66 feet. If the deep drainage of land which this distinguished engineer has advocated cannot be successfully carried out in all cases, the graphic manner in which he has described his own experience, and illustrated the principles of draining, has been productive of good results. Even on the most tenacious soils with subsoils of *till*, few now think of having drains less than three feet in depth, though the distance apart should not in many cases be more than from 15 to 18 feet.

The mere tenacity of clays is not the element which determines the depth of drains, or the distance at which they should be placed apart. It is now well understood that the success of draining by pipes depends upon the fissures which are produced in the subsoil by the droughts of summer never entirely closing up; and thus minute channels are formed, which lead the water into the drains. The coarse tenacious clays which are to be found in the chalk-valleys of England, *crack* readily by the droughts, and form deep fissures, which render them comparatively easily drained. On the other hand, in the moist climate of Scotland, the subsoils which are of *till* are long in cracking; and the drains in such land should not be so deep, and at shorter distances apart. As the properties of clays become better understood and classified, practical men will soon come to be more at one in regard to this important point connected with the economy of drainage.

The principal advantages of drainage are, the deepening of the staple soil, and rendering it more friable, so that a superfluity of water, which would cause the formation of those chemical compounds that are found in stagnant water, is prevented. The greater depth of mould, and more perfect culture, render the soil more absorbent of moisture in dry weather. As crops can usually be sown sooner on drained lands, they also ripen earlier, and produce more abundantly. In short, while drained land obtains a greater capacity for moisture and manure, it imparts to plants greater capabilities for economically working up the materials which they find both in the soil and atmosphere, seeing they are maintained in the most healthy conditions of growth.

Drainage in its various forms has, as is well known, not only improved the fertility and value of land in Scotland, but materially changed the aspect and climate of the country. Mosses and wet rushy lands have been transformed into dry and productive fields, while by the removal of all superfluous pools, the air is freed from those hovering vapours which are injurious to general amenity and salubrity. To the farmer, the more immediate advantage of drainage consists in that rapid running off of the water which falls as rain, so as to admit of working lands without any undue delay. This universal system of draining has had a remarkable effect on rivers, which, no longer fed by slow percolation from adjoining lands, are suddenly swollen after rain, and as suddenly diminished in volume. See RIVERS.

**DRAKE,** SIR FRANCIS, was born about the year 1539, in a cottage on the banks of the Tavy, in Devonshire. His father was a yeoman, and had a family of twelve sons. He was a zealous Protestant, and during the persecution under Queen Mary, he fled from Devonshire into Kent, in which county his family was brought up. He obtained some kind of clerical appointment among the seafaring-men of the district, and in consequence, D.'s younger years were passed among sailors. He was at an early age apprenticed to a neighbour of his father's, who possessed a bark, and occasionally made voyages to Zealand and France. When his master died, D. fell heir to the vessel, and carried on the old trade with considerable success. While coasting about, he heard of the exploits of Hawkins in the New World, and the recital took such a hold of his imagination, that, selling his ship, he proceeded to Plymouth, and joined Hawkins in his last expedition to the Spanish Main. The adventure was disastrous to all concerned, and D. came home much poorer than when he set out. Undismayed, however, he gathered around him wild and reckless spirits, and having raised sufficient money, they fitted out a vessel, and under the command of D. made several voyages to the West Indies. In 1570, he obtained a commission from Queen Elizabeth, and cruised in the West Indies, enriching himself with plunder. In 1572, he again sailed for the Spanish Main, and, assisted by some other English ships, he plundered the town of Nombre de Dios. He then crossed the Isthmus of Darien, and beholding the Pacific, prayed God to grant him leave to sail an English ship in that sea. On Sunday the 9th August 1573, he came into Plymouth laden with spoil; and when the news spread of his arrival, the people forsook the preacher, and came out to gaze on the brave and successful sea-rover.

Under the sanction of Queen Elizabeth, D. again set sail in 1577, taking with him five vessels. He sailed to South America, and plundered the coasts. In September of that year he entered the Pacific. During his voyage, he was singularly successful. He sacked the Spanish towns on the coasts of Chili and Peru, and he captured a royal galleon laden with plate. He then steered for the north-east, hoping to find a passage back to the Atlantic; but the severity of the cold discouraged his crew, and he took shelter in Port San Francisco. He stayed there several weeks, and formally took possession of the country in the name of the queen of England. He then steered across the Pacific for the Moluccas; reaching Ternate, he sailed for Java, thence he stretched right across the Indian Ocean for the Cape of Good Hope, which he doubled in safety, and arrived at Plymouth on Sunday the 26th September 1579. He was graciously received at court. Elizabeth banqueted on board his vessel, and conferred on him the honour of knighthood.

During part of 1585 and the whole of 1586, D. was employed, with a fleet of 21 ships, against Philip II. of Spain, chiefly in the West Indies and the coasts of South America. In this, as in his former voyages, he plundered many towns, and enriched himself with spoil. During this voyage, he visited Virginia, which colony had been recently planted by Raleigh. Thence he returned home, and it is said brought tobacco with him.

Spain was now preparing an Armada for the invasion of England, and Elizabeth sent D. with a fleet of 30 sail to destroy the enemy's ships in their own harbours. He entered the Roads of Cadiz, passed the batteries on the morning of the 19th April 1587, and before night, destroyed 100 vessels, and possessed himself of immense booty. He then sailed along the coast burning and plundering. He entered the Tagus, and flouted the Marquis Santa Cruz, who was lying in that river with a large force of galleys. Having done all the mischief in his power to Spain, D., with that keen appetite for plunder which never forsook him, steered for the Azores, on the look-out for homeward-bound treasure-ships. He was fortunate enough to encounter a richly laden carrack, of which he took possession. On his return, he spent a considerable portion of his prize-money in supplying the town of Plymouth with water.

D. was next employed as vice-admiral in the fleet under Lord Howard, which scattered the Armada, and broke the naval supremacy of Spain. In 1589, he was sent to Portugal with a fleet, to expel the Spaniards, who had taken possession of that kingdom; but the expedition was unsuccessful. On his return, he was elected member of parliament for Plymouth. In 1595, along with Sir John Hawkins, he was sent with a fleet to the West Indies. In the course of the expedition, the commanders quarrelled. Hawkins died before reaching Puerto Rico. Attacking the place, D. received a repulse. Sailing away, he burned and plundered several towns. He came to anchor in Nombre de Dios, where a deadly disease broke out among the soldiers and sailors of the fleet. D. was at last smitten, and after struggling 20 days with the malady, he expired on the 27th December 1595. On the day of his death, the fleet anchored at Puerto Bello, and there the bold sailor and bucaneer received his sea-funeral.

**DRAKE**, Friedrich, a celebrated German sculptor, born at Pyrmont, 23d June 1805, and trained under Rauch of Berlin. Among his principal works are a 'Madonna with her Infant' (purchased by the Empress of Russia), a 'Dying Soldier,' a 'Vintager,' 'The Eight Provinces of Prussia' (colossal allegorical figures, adorning a hall in the royal palace at Berlin), and a 'Warrior crowned by Victory,' which is reckoned one of the master-pieces of Prussian sculpture. But D. owes his celebrity chiefly to statues, busts, and medallions. There are few great countrymen of his of whom he has not preserved a marble memorial. His statues of Schinkel, the two Humboldts, Rauch, Justus Moeser, his bust of the naturalist Oken, and his two colossal statues of Frederick William III., king of Prussia, the one at Stettin, and the other at Berlin, deserve especial mention. D. is at present professor of sculpture in the Academy of Fine Arts at Berlin, and chevalier of the third rank in the order of the Red Eagle.

**DRAMA** (Gr. *drama*, from *draō*, I act), or dramatic poetry, in its most general signification, represents *actions*, which are not stately narratives, as in epic poetry, or which do not aim at the musical expression by language of mental emotions, as in lyric poetry. The drama consists of an impersonal representation, by the dramatist, of an animated conversation of various individuals, from whose speech the movement of the story is to be gathered. Thus, it is contrasted, on the one hand, with dialogue, or the dull and changeless flow of discourse, and on the other, with every other species of poetry, whether epic or lyric. In simple dialogue, the minds of the speakers remain unchanged; in the drama, the movement of the thoughts is so lively, and the expectation of the issue so vivid, that this species of poetry surpasses every other in interest and in intensity. In epic poetry, persons are frequently introduced engaged in lively conversation, and this is sometimes the case even in lyric poetry, but the prevailing tone of the epopee is descriptive and indirect. A novel, or an epic poem, can only be described as dramatic when it abounds in animated conversations, or when direct action prevails over description. All dramatic poetry may be divided into *tragic* and *comic*. Tragic poetry has for its aim to interest the earnest mind, while comic poetry merely endeavours to produce amusement. Tragic poetry may be described as that which interests the mind in the highest degree possible, and comic poetry as that which engages it in the most complete lawlessness. In comedy, gloom, sadness, sobriety, have no recognised existence; while in tragedy, gaiety, joviality, riotous mirth are unknown.

While the drama, doubtless, arose from that natural love of imitation peculiar to man, and from the childlike liveliness with which a simple narrator loves to recount anything which he has heard or seen, yet the creation of dramatic composition was, nevertheless, a feat of singular boldness. This arises from the wide difference there is between the disjointed elements of occasional imitation and the perfect invention of the genuine drama. The Old Testament, no doubt, contains numerous instances of dramatic dialogue, as in the Book of Job; and of lyric poems placed in a dramatic connection, as Solomon's Song; but there is no instance in Hebrew literature of the existence of the drama properly so called. The Hindus have an early dramatic poetry, but, unfortunately, this poetry only dates back to a time when the intercourse between Greece and India was close and frequent. It is to Greece alone that we, accordingly, must look for the invention of the drama, and to Athens, in particular, for its perfection. But even here it was originally exhibited only at a few festivals of a single god, Dionysus. There can, then, be no doubt that the origin of the drama is to be sought for in the enthusiasm attendant on the worship of Bacchus. The ancient Greek writers tell us, that the drama originated in a choral song; and Aristotle (*Poet.* 4), that it had its origin in the singers of the dithyramb. Supposing that it originated in the pantomimic dances, the dramatic art, like every other, was only slowly purified from extraneous mixtures. Even the origin of the word tragedy has been disputed, although the inventor of it, Arion (580 B.C.), the celebrated dithyrambic poet, is known. Tragedy (*tragōdia*, from *tragos*, a goat, and *ōdē*, a song) is said to have taken its rise from the fact of the old dramas being exhibited when a goat was sacrificed, or because a goat was the prize, or because the actors were clothed in goatskins. Comedy, again (*kōmōdia*, either from *kōmos*, a revel, or *kōmē*, a village), signifies, literally, either the *revellers' song* or the *village song*, from the practice of strolling-players publicly exhibiting their dramatic skill about the streets. Thespis (536 B.C.) introduced the regular dialogue into the choral representations, and joined a person to the dithyrambic songs, who was the first actor. Phrynichus (512 B.C.) used this single actor of Thespis for the representation of female characters, although with him the lyric element predominated over the dramatic. No further improvement of any note was introduced into tragedy before the time of Æschylus.

Comedy, again, arose about 580 B.C., with Susarion, who travelled about through Greece, ridiculing, from a small movable stage, the follies and vices of his time. Tragedy, from its first recognition, was deemed worthy, by reason of its superior gravity and staidness, to entertain the refined inhabitants of cities; while comedy, at the outset, from its riotous fun and jollity, was judged more in harmony with the rustic habits of the country people. In time, comedy made its way into the city, and Epicharmus (485 B.C.), besides modelling this form of dramatic wit, after its more successful rival, tragedy, likewise introduced a number of distinguished comedians to the notice of the Athenians. Phormes, Magnes, Crates, Cratinus, Eupolis, Pherecrates, and Aristophanes, are the highest names in connection with the old Greek comedy, the last mentioned being, however, by far the greatest. Tragedy, both from its ideal character, and from the stately cothurnus and long masks in which the actors of it appeared, aimed at a representation of what was dignified, noble, and grand in human nature. Comedy, again, from its style of caricature, its low-heeled sock, and its grotesque masks, tried to degrade humanity beneath its natural level. Comedy, during the Greek period of its history, divides itself into three forms—viz., Old Comedy, Middle Comedy, and New Comedy. The old comedy is the directly opposite of tragedy; its form is essentially sportive, and a seeming aimlessness reigns throughout it. It is, in the opinion of A. von Schlegel (*Lectures on Dramatic Literature*), the only genuine poetic species of comedy, while the other forms of it shew a tendency to decline into prose and matter of fact. In the new comedy, again, the form is rather serious than otherwise, and it is regularly tied down to the accomplishment of a certain aim. This is what is understood by comedy at the present day. It is a mixture of tragedy and comedy proper, of earnestness and mirth. Only fragments of Menander and of Philemon, the genuinely witty poets of the new comedy, have come down to us. The middle comedy, again, which came in between the old and the new, arose after the termination of the Peloponnesian war. The new oligarchy strictly prohibited the introduction of living persons by name on the stage; and the chorus, till then the chief instrument of vituperation, is said to have been abolished.

With Æschylus, Greek tragedy properly begins. He instructed his actors himself in the rehearsal of his pieces. In his dramatic compositions he aimed more at sublimity than beauty, more at the heroic than the human. Sophocles, again, who was, perhaps, superior to Æschylus in his appreciation of human nature, strove more to depict idealised men than to paint heroic excellence. He introduced a third actor on the scene, and materially improved the mechanism of the stage. Euripides was too much of a nice speculator to attain to the highest forms of poetic expression. Instead of quietly contemplating life as Sophocles did, he seems to have been morose and peevish; but in point of moral denunciation, no dramatist surpasses him. With these three great poets, Greek tragedy may be said to close. With them it ceased to be the tragedy which Aristotle has described in his celebrated definition of it. 'Tragedy,' he says (*Poetics*, 6), 'is the imitation of some action that is serious, entire, and of a proper magnitude; effecting, through pity and terror, the refinement of these and similar affections of the soul.' In the hands of the subsequent authors this form of the drama grew lax and effeminate, and in the performances of Theodectes especially, tragedy was made to give way to rhetoric. (See the works of Böckh and Welcker on the Greek tragedians; also, Müller's *Literature of Ancient Greece*.)

The Romans were not a great dramatic people. They borrowed, according to the common account, during a period of national despondency occasioned by a desolating pestilence (A.U.C. 391), their first idea of a play from the Etrurians; their effusions of sportive humour, their *Fabulæ Atellanæ*, from the Oscans; and the higher class of dramatic compositions from the Greeks. Philology, likewise, countenances this story; for *histrio*, the Latin word for a player, is pure Etruscan. No remains of any note have come down to us of the comic writers of Rome, except Plautus and Terence. The former was a poor day-labourer, the latter a Carthaginian slave. The habits of each appear in their writings. Plautus has a degree of rough vigour and broad jocularity, born of the hand-mill and the plough, while Terence is more refined and delicate in his wit and characterisations. Both these writers borrowed largely from the Greeks. Of the early period of Roman tragedy no remains exist, but it is probable that its poets were merely translators or imitators of Greek models. The tragedians of the Augustan age were ambitious of rivalling the Greeks. Unfortunately, none of these grand attempts have come down to us, except ten bombastical and frigid dramas, that go under the name of Seneca.

Ancient art fell with pagan Rome. In the early ages of Christianity, any one connected with the theatre was not allowed baptism. The unwise zeal of the fathers was followed by an edict of the Emperor Julian to the same effect. The two Apollinarii, father and son, and Gregory of Nazianzen, attempted to introduce religious plays or mysteries, drawn from the Scriptures, to amuse the Christian people during the operation of Julian's law. In a short while, instead of the drama proper, there was nothing to lighten up the surrounding darkness but such productions as the saturnalian pageants, the Feast of Fools and the Feast of the Ass.

The Italians are the first people of Europe, who, after the long sleep of the true dramatic spirit in the middle ages, strove to enkindle the ancient fire upon Roman hearths that had for long years been cold. Early in the beginning of the 16th c., the first regular modern drama was published. It was called *Sophonisba*, and the writer was a very commonplace author, by name Trissino. Shortly after, this tragedian was followed by Ariosto, by Babbiena, and by Macchiavelli, all distinguished cultivators of the classic comedy. Towards the end of the century, Giambattista de la Porta, philosopher and comic writer, exhibited a number of pieces of a familiar, and sometimes even farcical kind, but full of happy invention and agreeable originality. The political influence of Spain was now at its height on Italian territory, and the romantic drama of the west gradually found favour in Italy. Even so early as 1529, Ricchi had attempted to overthrow the classic taste in Italy, but without success. It remained for Borghini, Oddi, and M. A. Buonarroti, the nephew of the great artist, and one or two other writers, to break in upon the current taste, and to do much to introduce the romantic drama in Italy. In the 17th c., Rinuccini, by the union of music with the romantic drama, succeeded in establishing the *melodrama*. Tragedy and comedy were now entirely laid aside as antiquated, and nothing but the *musica opera* was heard of from Milan to Ravenna. Maffei led the way in reforming the Italian stage. The political preponderance of Spain had now given way to that of France, which facilitated his labours not a little. His *Merope* is a fine attempt to restore the tragic drama to Italy, but as Lessing says of it, in his *Dramaturgie*, it is rather the production of a 'learned antiquary' than of a great tragic poet. The musical drama had now to be rendered classic, and this task was undertaken by Zeno and Metastasio. The latter, who has all the attractiveness for the Italians that the classic Racine has for the French, by subtle harmony and grace in his songs, by his power of painting pathetic situations, and by his melting effeminacy of manner, charmed the hot southerners as no other poet yet had done. After Goldoni, a great comic authority in Italy, and a careful student of Macchiavelli and Molière, except Riccoboni and Gozzi his rivals, we have few dramatists of any note till we come down to last century. The bold and passionate Alfieri inaugurated a new era in Italian tragedy. He is a follower of the classic school, and a strict observer of the Aristotelic unities. His successors have relaxed more their adherence to classic forms, and have produced some very admirable dramas. Among the most estimable of those writers are Monti, Manzoni, and Niccolini.

In the other European nations as soon as dramatic composition rose to any degree of purity, it became thereby disconnected with the church.

But in Spain this is by no means the case, for their best poets, while writing for the stage, have busied their pens in the composition of religious dramas. Passing over the names of Villena, Santillana, Naharro, and Rueda, as diligent but comparatively weak builders of the fame of the Spanish drama, we come to the periods of Cervantes, of Lopez de Vega, and of Calderon, when the Spanish stage may be regarded as in its best condition. In his *Numantia* particularly, Cervantes, whose genius was more decidedly epic than dramatic, has left to the world a specimen of tragic invention and of moral dignity which it is not likely to forget. While the critics were clamouring about the classic rules and the Aristotelic unities, Lopez de Vega appeared on the scene, to set nearly all the dramatic laws at defiance. He is the most fertile dramatic writer in the world, besides being one of the best. Yet he prostituted his pen to serve the public, and sacrificed his future fame to his living popularity. Calderon, who succeeded him, possessed all his advantages, with the important additional merit of being thoroughly devoted to dramatic art as to a mistress. So great was Calderon reckoned in the composition of religious plays, that by letters-patent he enjoyed a monopoly of these productions for 37 years. The brilliant period of the Spanish theatre, comprising the first half of the 17th c., had with the death of Calderon well-nigh closed. Except Moreto, Tirso de Molina, and Solis the historian, there is no writer of any note to engage the attention.

We come now to France, where the unities, as they are called, have been observed with as much strictness as if the country had been an old Grecian province. This is chiefly owing to the influence of the criticisms of Boileau, who adopted the dramatic unities in all their severe rigour. The critics of other nations, particularly of Germany and of England, have chosen to contemn this exposition of the drama, and sometimes to despise even the Stagirite as a dramatic critic. The dramatic unities are threefold—Action, Time, and Place. According to the French, these unities have the following significance: 1. That the action of the drama must be one—that is, that the interest or attention must not be distracted by several plots, but everything must be subservient to the main action; 2. That all the actions must take place on the same spot, or very nearly so, in order that the illusion may not be disturbed; and 3. Everything should happen on the same day for the same reason. Much has been written for and against these rules. Suffice it to say, that these are the landmarks on which the classic dramatist fixes his eye. Previous to Jodelle, or indeed to Corneille, hardly any progress had been made in the regular drama in France. A number of writers, of more or less ability, had produced *mystères*, *soties*, *moralités*, *farces*, in which, in numerous instances, the romantic or anti-classical tendencies of human nature had manifested themselves; but neither in the case of the Brethren of the Passion, nor in the case of the *Enfans sans Soucis*, was there any progress made in the proper business of dramatic composition. Jodelle was the first writer who composed a regular five-act tragedy, and he publicly exhibited it in the presence of the court of Henry II. of France. He composed other pieces of equal, many of superior, merit, but nothing of any importance in the drama appeared before the time of Corneille. This writer, who appeared in the reign of Louis XIV., during the time that the star of Richelieu was in the ascendant, had to humour the court by humouring the academy, and to please the academy he required to observe the rules of Aristotle. He produced seven plays, as cold and as severe as if they had been written by Sophocles, but of great elegance and dignity of style, when it struck him that he might give more free scope to his romantic tendencies in the tragedy of the *Cid*. All Paris rang with its praises, but the academy gloomed, and poor Corneille had to betake himself again to the dignity and severity of the Greek drama. He got what he longed for, however—a seat among the members of that institution which had been so instrumental in repressing the spontaneous outflow of his genius. It was more than his successor, Molière, obtained, who insisted to the last on playing his part as well as penning his pieces—an abuse which the dignified academicians could by no means tolerate. The genius of this dramatist was decidedly comic, and it may perhaps be questioned, whether, in all the essentials of true comedy, Molière's is not the very foremost name in the history of the stage. He borrowed much from the Spaniards, though perhaps less than Corneille; a great deal from the Latins; and more perhaps from the Italians. But the favourite tragic poet of the court of Louis XIV. was Racine. His genius lay decidedly towards the serious and the exalted, so that he had no temptations, like Corneille, to trespass the bounds of the academic proprieties. In tenderness and elegance, all French writers give way before him. In his *Athalie*, his last and best drama, he gave to the Parisian public a composition, such as in breadth, in elegance, and in severe grandeur, it could nowhere find out of the Greek theatre. But we must push through the crowd of lesser lights which shone on the decline of Racine and Molière, and glance at that bright and fitful luminary—Voltaire. He pressed boldly forward, and astonished all Europe with the force and power of his romantic dramas, a style of composition which, since the *Cid* of Corneille, had been altogether excluded from the theatre. His spirit of intolerance was perhaps felt in his dramas, and his increasing warfare with superstition and fanaticism was too distinctly experienced even in the theatre. But his genius and spirit have earned for him a place beside Corneille and Racine as one of the tragic names whom France delights to remember. Boursault, Regnard, Legrand, Lemercier, Victor Hugo, Dumas, and Alfred de Vigny, would all require to be noticed in a full view of the French drama.

The German drama is almost wholly dependent for its fame on the names of Lessing, Goethe, and Schiller. For while Rosenpluet, Hans Sachs, and Ayrer were original, and some of them fertile; while Gryphius, Gottsched, Gellert, and Schlegel shew a decided advance in the appreciation of the laws of dramatic composition; yet from the feebleness of the writers, and from the backward state of theatrical taste in the end of the 17th and the beginning of the 18th centuries, very little was done towards a clear and distinct recognition of the excellence of dramatic literature, till the critic Lessing, in his *Miss Sara Sampson*, taught Germany to appreciate the productions of the romantic drama. As a critic, he blamed the French, praised Shakspeare, and professed belief in Aristotle. He held more than one dramatic heresy, and his antipathy to versification was among the number. Goethe is, without doubt, one of the greatest geniuses which the world has seen, but whether he is entitled to so high a place for his theatrical dramas remains an open question. As his aim was more emphatically the culture of his genius in its fullest form, the circumstance of his writings assuming the dramatic form is rather an accident than otherwise. From first to last he seems to have been distinctly aware of this, and in the prologue to his last, and by far his grandest production, he declares why he could not accommodate his genius to the demands of a mixed theatre. Yet his *Faust* must ever be regarded as one of the grandest and most remarkable compositions which modern Europe has witnessed. Schiller was more expressly the dramatic poet of Germany than Goethe. While Goethe's genius was fuller and more complete, Schiller made up for what he wanted in breadth of vision by the moral intensity of his genius. From his wild play of the *Robbers*, down to his last drama of *Wilhelm Tell*, he worked with a vehemence such as has very seldom been witnessed. But he filled Germany, and indeed all Europe, with his tragic fame, and his name is one which 'posterity will not willingly let die.'

Dramatic exhibitions in England, if they did not originate in the church, were nevertheless speedily appropriated by the clergy. Ecclesiastics were frequently the composers of the religious pieces, or mysteries, and they were found not seldom to be the actors. The mass of the people, no doubt, owed a good deal of grotesque amusement, and even of occasional information, to the biblical and legendary history, which those rude attempts at the drama were fitted to convey. Those old religious plays are generally divided into two classes—*miracles* or miracle-plays, and *moralities* or morals. The former were founded on Scriptural narratives, or on the legends of the saints; the latter arose from the former, by the increased introduction of imaginary features. These pious pastimes existed long before the Reformation, and were not overthrown by that great revolution in the opinions and beliefs of the country. See MIRACLE-PLAYS and MORALITIES. It was about the middle of the 16th c. that the drama extricated itself completely from these ancient fetters. By this time both comedy and tragedy had begun to exist in a rude reality in England. The oldest known comedy (before 1557), that of *Ralph Roister Doister*, was written by Nicholas Udall, a schoolmaster of considerable learning, probably about the middle of the 16th century. Ten years after appeared our first tragedy, known variously as *Gorbudoc*, or as *Ferrex and Porrex*, by Mrs Norton and Lord Buckhurst. And not only is this work the earliest tragedy in our language; it contains, beside, the first application of blank verse to dramatic composition. But the play is dull, heavy, and declamatory. The drama lingered in this incipient condition until very near the time of Shakspeare. Bishop Still's *Gammer Gurton's Needle* is no improvement on *Roister Doister*. The names of Kyd, Lodge, Greene, Lyly, Peele, Marlow, Nash, &c., must pass before us almost without comment. Many of these writers are not without their merits, particularly Marlow, whose plays of *Edward II.* and of *Dr Faustus* are acknowledged by Charles Lamb to contain passages that Shakspeare himself has not surpassed. Marlow, besides, is the first author who introduced blank verse upon the *public* stage. But all these dramatists are obscured by their nearness to the great luminary of the English drama. Shakspeare is now almost universally acknowledged to be the greatest dramatic genius that has ever appeared in the world. He brought the romantic drama to a perfection which it is not likely to surpass. His writings present the finest example of the depth, sublimity, refinement, and variety of which the drama is capable; and they are abundantly marked by those peculiar characteristics which sprung from the union, in the person of its author, of such wonderful powers of conception with such familiar experience of theatrical management. Of course he despised the unities, or rather, we might say, he worked in ignorance of them, for he knew nothing of Aristotle and Boileau; and the rest of the French critics were not born when he died. Hence his drama is known in literature as 'irregular;' and, we fear, human nature is likewise very irregular. The poet trusted to his own instinctive judgment, and of its exercise we have all fortunately plenty of examples. The principal of Shakspeare's contemporaries are Ben Jonson, and Beaumont and Fletcher. Like Shakspeare, Jonson wrote both tragedies and comedies. Milton speaks of 'Jonson's learned sock,' and thus hits off the main feature of his character as a dramatist in a phrase. Beaumont and Fletcher, who were, like many brotherly men in that age, joint-workers, have the honour of standing next to Shakspeare in the romantic drama of England. But, like Lopez de Vega, they wrote too much for the mere success of the moment to be ranked in the foremost file of England's dramatic writers. With Massinger, Ford, and Shirley, the old English drama is closed. Dryden, the literary chief of his age, who flourished during the latter half of the 17th century, wrote some fine pieces of Frenchified declamation. Lee, and the unfortunate Otway, bring down the drama to the beginning of the 18th century. For, while Gay, Congreve, Cibber, Wycherley, Vanbrugh, and Farquhar, all display considerable dramatic spirit and invention, their works are, nevertheless, morally considered, the foulest things in the language. They paint well the externals of society, and have left behind them good specimens of the 'comedy of manners,' as it has been called; but vice is both warp and woof of nearly everything they have produced. Addison, Johnson, Young, Thomson, &c., wrote some good poetry, but poor dramatic verse; while Lillo, Moore, Garrick the actor, Goldsmith, the Colmans, and Cumberland, nearly all took to prose instead of verse. They produced agreeable comedies, but nothing of a very marked kind in the history of the drama appears until the time of Sheridan, who gave an impulse to 'genteel comedy,' such as has placed him ever since at the head of the writers of that species of composition. Holcroft, Mrs Inchbald, 'Monk' Lewis, and Maturin, mostly influenced by inferior German writers, have left behind them a legacy of terror and of wonder fit to render their period marvellous, if for nothing else. Joanna Baillie and Sheridan Knowles remind the reader of the excellences of the old English drama, and the *Lady of Lyons* of Bulwer Lytton is a favourite with playgoers of the present day. Byron, Coleridge, and Henry Taylor, are the authors of fine meditative dramas, but they are more suitable for the closet than for the stage. Our sketch of the drama would not be complete without allusion to the labours of Talfourd, Jerrold, Shirley Brooks, Westland Marston, Tom Taylor, and Charles Reed, who have each, after his fashion, endeavoured to sustain the stage of England from falling into utter disgrace in the present day.

**DRAMA'TIC WORKS**, COPYRIGHT IN. Dramatic and musical works enjoy a legislative protection peculiar to themselves. By 3 and 4 Will. IV. c. 15, it is provided that the author of any dramatic piece not printed or published by him or his assignee, shall have, as his property, the sole liberty of representing it, or causing it to be represented, at any place of dramatic entertainment; and the author of any published dramatic work shall have the same privilege during his life, or his assignee for twenty-eight years from the date of publication. By 5 and 6 Vict. c. 45, s. 20, the provisions of the former statute are extended to musical compositions; and the term of copyright provided for other works (see COPYRIGHT) is applied to the liberty of representing dramatic pieces and musical compositions. The following section (21) reserves to the proprietors of dramatic works the remedies given them by 3 and 4 Will. IV. c. 15, s. 2. These are the power of exacting from every offender a sum not less than forty shillings, or the full amount of the benefit or advantage arising from the representation, or a sum equivalent to the loss sustained by the plaintiff, 'whichever shall be the greater damages.' The action must be brought within a year. The provisions of the act extend to both sexes.

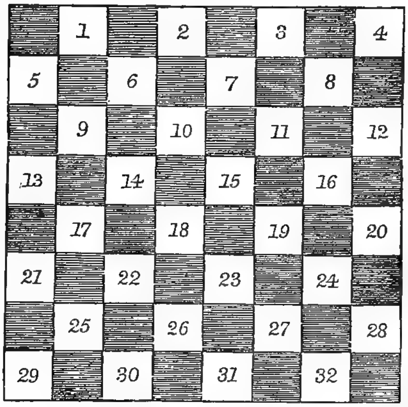
**DRA'MMEN**, a seaport town of Norway, in the province of Aggerhuus, on both sides of the river Drammen, which here discharges its waters through the Drammen fiord into the Gulf of Christiania, about 24 miles south-west of Christiania. D., which is built in a valley, is divided into three quarters—Bragenœs on the north bank of the river, and Stromsoe and Tangen on the south, united to the first-mentioned quarter by a handsome bridge. The chief streets, which run along each side of the river, are composed, for the most part, of warehouses. The manufactures of D. are leather, ropes, sailcloth, tobacco, spirits, and earthen-ware; but the inhabitants are chiefly engaged in connection with the export of timber. Pop. 12,000.

**DRA'PERY** (Fr. *drap*, cloth), any kind of woollen cloths for dress, the dealers in which in England are known as Drapers. In London, the Drapers' Company is one of the more wealthy civic corporations, with a Hall and Almshouses.

**DRA'PERY** in Art. From the very great difficulties with which the artist has to struggle in dealing with the arbitrary and ungraceful forms of modern dress (see COSTUME), we are often led to regard drapery as an impediment, in place of an aid and accessory, to the representation of the human form in plastic art. The erroneous nature of such a conception will be manifest at once to those who direct their attention to the study of drapery in antique art, with a view to discovering not so much how as why it was employed by a people whose national customs admitted of their almost wholly dispensing with it had they felt so disposed. Such a study will convince us that, when properly disposed, drapery tends, in many cases, to exhibit the form, to enhance the characteristics, and to intensify the attitude, whether in action or in repose. It tells, moreover, something of the circumstances in which the action takes place beyond what could possibly be told by the naked figure. The waving drapery of a hunting Diana, or an Apollo shooting with the bow, tells us at once that the action is taking place in the open air, with the fresh breezes of the Ægean blowing around them. On the other hand, that repose which is the peculiar characteristic of sovereignty, is indicated by the still and heavy character of the drapery which surrounds a Jupiter on Olympus, or a Cæsar on his throne. The simple rule—simple in principle, though by no means always easy in practice—for the disposal of drapery, seems to be that it shall never be employed without an object; and that every fold shall, so to speak, be a logical result, either of the form of the figure, of the circumstances in which it is placed, or of some previous fold to which the latter is subordinated.

**DRAUGHT** or **DRAFT OF WATER**, in maritime affairs, is a technical name for the depth to which a ship sinks in the water when fairly afloat. The draught is marked on the stem or stern-post, or both, from the keel upwards. When a ship is in good trim, the draught does not differ much at the two ends. Ships with sharp bottoms draw more water, or have a 'greater draught,' than those of flatter construction. For draught as applied to ploughs, wagons, &c., see TRACTION.

**DRAUGHTS**, like chess, is a game played with 'men' on a checkered board. As far as the *science* of the game is concerned, it falls far short of chess, but is nevertheless a favourite recreation with many classes of people. In France, it is called *Les Dames*, from its having been a favourite game with ladies; and in Scotland, the *Dambrod*. The following is a representation of the draught-board, numbered for the sake of illustration, and placed as it should be in playing:



Two persons usually play this game, each having a set of twelve men—one set black, the other white. The men may be placed either on the black or white squares, but the whole must be placed on one colour only. Thus, in England, it is usual to play upon the white squares, with a black square to the lower right, as above shewn; and in Scotland upon the black, with a white square to the lower right. The above illustration, therefore, shews the English method, and as such we shall consider the mode of playing the game. In chess, the men may be moved straight forward, sidewise, or diagonally, and over many squares at once; but in draughts, the men may be moved diagonally only, and by *one* square at a time. If an enemy's man stand in the way, no move may take place unless there be a vacant square beyond into which the piece can be lifted. The man leaped over is then taken and removed from the board. The grand object of the game is, therefore, to clear the board of the enemy's men, or to hem them in so that they cannot be moved, and whichever party does so first, wins the game. As no piece can move more than one step diagonally at a time, there can be no taking till the antagonists come to close quarters; and the advancing of them cautiously into each other's neighbourhood is the chief art of the game. When a man on either side has made his way either by taking or by a clear open path, to the opposite side of the board, he is entitled to be 'crowned,' which is done by placing another man on the top of him. Crowned men may move either backwards or forwards, but always diagonally and by one square at a time, as before; and this additional power thus gained gives a great advantage to the player who owns the greatest number of crowned heads, and usually decides the game in his favour.

**DRAU'GHTSMAN.** A draughtsman differs from a designer inasmuch as he lays no claim, in that capacity at all events, to the character of an originator.

**DRAVE** (Ger. *drau*), a river of Austria, rises in the east of Tyrol, in lat. 46° 45′ N. and long. 12° 25′ E., flows north-east through the Pusterthal towards Lienz, where it is joined by the Isel. It then flows east through Carinthia, passes Villach, where it becomes navigable, after which it passes Marburg, receives the Dran from the right, and the Mur, its principal affluent, from the left; then turning towards the south-east, it forms the boundary between Croatia and Slavonia on the right, and Hungary on the left, and pours its waters into those of the Danube at a point ten miles east of Essek, the capital of Slavonia. The D. is nearly 400 miles long. In the first part of its course, it is a mountain torrent, rushing furiously through the mountain passes of Tyrol; but joined by numerous streams, its volume increases, and its course becomes more staid. The valleys through which it flows in its course through Carinthia, Styria, and Croatia, are distinguished by great fertility and picturesque scenery, while the population upon its banks is numerous and industrious. In Slavonia, the D. is frequently bordered by dense forests.

**DRAW′BACK**, a term in commerce, employed in connection with the remitting or paying back of excise duties on certain classes of articles exported. Excise duties, as a matter of course, enhance by so much the natural price of the commodity on which they are imposed. Were these duties not remitted, the commodity so taxed would not be ordered from those foreign countries where articles of the same kind could be purchased free of such duties. To afford facility for the exportation of these articles, the state resorts to the expedient of returning to the exporter a sum equal in amount to what he or the manufacturer had paid to the excise. Such is drawback. Among other matters of fiscal policy, Adam Smith, in his *Wealth of Nations*, discusses the propriety of giving drawbacks, and sees in them nothing that is adverse to a sound political economy. 'To allow,' he says, 'the merchant to draw back upon exportation, either the whole or a part of whatever excise or inland duty is imposed upon domestic industry, can never occasion the exportation of a greater quantity of goods than what would have been exported had no duty been imposed. Such encouragements do not tend to turn towards any particular employment a greater share of the capital of the country than what would go to that employment of its own accord, but only to hinder the duty from driving away any part of that share to other employments. They tend not to overturn that balance which naturally establishes itself among all the various employments of the society, but to hinder it being overturned by the duty: they tend not to destroy, but to preserve, what it is in most cases advantageous to preserve, the natural division and distribution of labour in the society.' Correct as is this view in general principle, it could perhaps be shewn, by the closer experience of the present day, that the practice of giving drawbacks is liable to abuse; as, for example, when an exciseable article falls greatly in value, and it is exported in order to get the drawback, with little or no reference to sales abroad, or in the hope that the drawback will at least bring the amount of the freight. So far, therefore, the state is made to foster an improper species of commerce. To prevent deceptions as far as is practicable, certain rules and formalities have to be attended to by exporters, to which we shall briefly refer.

In preparing goods for drawback, they must be packed in presence of an excise officer, who sees them weighed, if the drawback depends on weight. When the package is completed, he encloses it with a tape, which is properly fixed with a seal. Under this seal it is transferred to the port of shipment, and cleared for export by a person authorised by licence from the officers of customs. In the case of press-packed goods, the quantities and qualities must be verified by the oath of the master-packer or his foreman. Drawback is given only on goods which have been charged with duties within three years, and no drawback is given on damaged or decayed goods. It is payable only to the real owners of the articles shipped. It is not payable for a certain period after shipment and departure; but cannot be demanded later than two years after shipment. As a verification of the principal particulars mentioned, the excise-officer concerned executes a certificate or Debenture (q. v.), and under its operation the drawback is paid by the inland revenue department.

**DRA′WBRIDGE.** See BRIDGE.

**DRAWER OF A BILL.** See DRAFT, BILL.

**DRAWING** is the art of delineating form, as opposed to colour and light and shade. The term is not confined to the first outline produced by the pencil or crayon, though this is a narrower sense in which it is also used, and what we commonly mean when we speak of a drawing. In its wider sense, drawing is used to describe what is in reality the most important feature of a finished painting of Raphael or Correggio, as well as of an outline by Flaxman or Retch. Drawing, in this sense, has been termed the grammar of art. But the analogy is incomplete; for the one quality which is requisite in the application of grammar, is correctness, whereas drawing, even when correct, even when faultless, admits of degrees of perfection. It may be more or less powerful, more or less free, more or less graceful; and indeed there is no characteristic in which the great artists of the Italian and Flemish schools more unmistakably excel all their successors, than in the power and beauty of their drawing. Neither is there any feature which more unmistakably stamps the individuality of the artist upon the picture.

**DRAWING AND QUARTERING.** The punishment for treason still is, that the offender be *drawn* to the place of execution on a Hurdle (q. v.); that he be hanged by the neck till he be dead; that his head be severed from his body, and that body be divided into four parts, or *quartered*. The sovereign may, and now certainly would, by a warrant under the sign-manual, countersigned by a principal secretary of state, change the sentence into beheading. In the case of females, the quartering is dispensed with. Stephen's *Commentaries*, iv. 234. See TREASON.

**DRAWING-BOARD**, a board on which drawing-paper is strained for painting on in water-colours. The paper is wetted for the purpose of being strained, and when attached at the edges, it is permitted to dry and contract. Formerly, the drawing-board was fitted into a frame, the edges of the wet paper being made fast by the pressure of the frame on the board. But the much simpler drawing-board which is now in use is made of a flat piece or pieces of wood, held together, and prevented from warping by an edging of other pieces, the grain of which runs in the opposite direction. The wet paper is attached to the edges of the board with paste or thin glue, and when dry, becomes perfectly firm and flat. When the work is finished, the paper is cut beyond the drawing with a knife.

**DRAW-PLATE**, a steel-plate with a graduated series of holes, through which metals are drawn in making them into wires or bars.—Also a name given to a plate of metal placed before a fire or before the lateral opening between the top of the fireplace and the throat of the chimney. Its use is to force the air to pass through the fire on its way into the chimney, instead of allowing it to pass over the fire.

**DRAYTON**, **Michael**, was born in 1563 at Hartshill, in Warwickshire. Of the events of his life but little is known. He is supposed to have studied at the university of Cambridge, and to have been in the army when young. His earliest work, *The Shepherd's Garland*, was published in 1593. He afterwards published the *Barons' Wars*, *England's Heroical Epistles*, &c. The *Polyolbion*, the work by which he is best known, appeared in 1613. He was poet-laureate in 1626; he died in 1631, and was buried in Westminster Abbey.

As a poet, D. is but little known, save to readers like Charles Lamb, who delighted in the obscure corners of literature. His *Polyolbion* is a topographical poem; and passages from it, now and then met with in county histories and works of an antiquarian character, surprise the reader with their stately rhythm, their nervous force, and their felicity of diction.

**DRA'YTON-IN-HALES**, or **MARKET DRAYTON**, a town in the north-east of Shropshire, on the Tern, near the Birmingham and Liverpool Canal, 19 miles north-east-by-north of Shrewsbury. Pop. (1861) 5242, chiefly agricultural. There are manufactures of paper, and of hair-seats for chairs. The parish church was built in Stephen's reign, but quite altered by repairs in 1787. Here, in 1459, the Yorkists defeated the Lancastrians.

**DREAMING.** In complete sleep, there is probably an entire absence of consciousness of external things. Usually, however, there is a certain amount of mental activity, of which we are more or less conscious at the time, and of which we have more or less subsequent remembrance. This is the state known as dreaming. The chief feature of this state is 'an entire *absence of voluntary control* over the current of thought, so that the principle of *suggestion*—one thought calling up another, according to the laws of association—has unlimited operation.' We seem to perform all the actions of life; we experience every kind of mental emotion, and sometimes our reasoning processes are remarkably clear and complete. Thus, when the mind, during sleep, takes up a train of thought on which it had been previously engaged during the preceding waking hours, intellectual efforts may be made during sleep which would be impossible in the waking state. Such cases, however, are not common. To name two instances (quoted by Dr Carpenter in his essay on Sleep in the *Cyclopædia of Anatomy and Physiology*): Condorcet saw, in his dreams, the final steps of a difficult calculation which had puzzled him during the day; and Condillac states that, when engaged with his *Cours d'Etude*, he frequently developed and finished a subject in his dreams which he had broken off before retiring to rest.

Occasionally, but by no means commonly, dreams seem to possess a remarkable coherence and congruity in reference to the reasoning processes, or the combinations of the imagination. Most of our readers are probably acquainted with the incident narrated by Coleridge of himself, that his fragment, entitled *Kubla Khan*, was composed during sleep, which had come upon him in his chair whilst reading the following words in Purchas's *Pilgrims*: 'Here the Khan Kubla commanded a palace to be built, and a stately garden thereunto; and thus ten miles of fertile ground were enclosed within a wall.' Coleridge continued for about three hours apparently in a profound sleep, during which he had the most vivid impression that he had composed between 200 and 300 lines. The images, he says, 'rose up before him as things, with a parallel production of the correspondent expressions, without any sensations or consciousness of effort.' On awakening, he had so distinct a remembrance of the whole, that he seized his pen and wrote down the lines that are still preserved. Unfortunately, he was called away to attend to some business which lasted more than an hour, and on his return to his study, he found, to his intense mortification, that 'though he still retained some vague and dim recollection of the general purport of the vision, yet, with the exception of some eight or ten scattered lines and images, all the rest had passed away like the images on the surface of a stream into which a stone had been cast.' In other cases, a dream may leave a strong general impression on the mind, although particulars, even immediately on waking, cannot be recalled. Tartini is said to have composed the *Devil's Sonata* under the inspiration of a dream, in which the archfiend challenged him to a trial of skill. The dreamer lay entranced by the transcendent performance of his distinguished visitor; but on awakening and seizing his violin, although he was unable to reproduce the actual succession of notes, he produced from his general impressions the celebrated composition which we have named.

Generally, however, dreams are wanting in coherence; all probabilities, and even possibilities of 'time, place, and circumstance' are violated. Friends long since dead appear and converse with us; and events long since past rise up before us with all the vividness of real existence. We may be conveyed to the antipodes, or even to worlds beyond our own, without the difficulty of the distance at all standing in the way. We are not aware of the grossest incongruities, probably because we are unable to test the probability of the phenomena by our ordinary experience; hence nothing that we see or do in a dream surprises us. Professor Wheatstone observes, that 'we may walk along the brink of a precipice, or see ourselves doomed to immediate destruction by the weapon of a foe, or the fury of a tempestuous sea, and yet not feel the slightest emotion of fear; though during the perfect activity of the brain we may be naturally disposed to the strong manifestation of this feeling. Again, we may see the most extraordinary object or event without surprise, perform the most ruthless crime without compunction, and see what in our waking-hours would cause us unmitigated grief, without the smallest feeling of sorrow;' and Cicero, who long previously had made dreaming his study, justly remarks (*De Divinatione*, 59), that if it had been so ordered by nature that we should actually do in sleep all that we dream, every man would have to be bound down on going to bed. Occasionally, however, in place of this passive condition, the emotions may be highly excited; thus, for example, the sailor's wife is apt, especially in stormy weather, to dream of shipwreck, and to shriek with terror from its attendant miseries; and those who have once in their lives been exposed to some fearful danger, are apt to have the scene recalled to them in their dreams, either with all its appalling and lifelike exactness, or possibly in a grotesque and impossible modification.

Although the predisposing causes of dreams may be sought for in more than one direction, they are probably in general referrible to some peculiar condition of the body, and are often called into action through the agency of the external senses. Dr Gregory relates, that having occasion to apply a bottle of hot water to his feet at bedtime, he dreamed that he was walking up Mount Etna, and found the ground insufferably hot. Dr Reid having had a blister applied to his head, dreamed that he was scalped by a party of Indians. M. Gizon de

Buzereinges made a series of pre-arranged experiments, with the view of seeing how far he could determine at pleasure the character of his dreams. In his first experiment, having allowed the back of his head to be uncovered during sleep, he thought that he was at a religious ceremony in the open air; the custom of the country in which he lived being to keep the head covered, except on some rare occurrences, among which was the performance of religious ceremonies. On waking, he felt cold at the back of the neck, as he frequently had felt when present at the real ceremonies. He repeated the experiment in two days with the same result. In a third experiment, he left his knees uncovered, and dreamed that he was travelling at night in the diligence; and all travellers know, he observes, that it is chiefly at the knees that they feel cold when travelling by that conveyance at night.

One of the most remarkable phenomena of dreaming, is the rapidity with which long trains of thought pass through the mind. A dream requiring hours for its accomplishment, is begun and terminated in a few seconds. A person who was suddenly aroused from sleep by a few drops of water sprinkled in his face, dreamed of the events of an entire life in which happiness and sorrow were mingled, and which finally terminated with an altercation upon the borders of an extensive lake, in which his exasperated companion, after a considerable struggle, succeeded in plunging him. Dr Abercrombie relates a similar case of a gentleman who dreamed that he had enlisted as a soldier, joined his regiment, deserted, was apprehended, carried back, tried, condemned to be shot, and at last led out for execution. After all the usual preparations, a gun was fired; he awoke with the report, and found that a noise in an adjoining room had both produced the dream and aroused him from sleep. Dr Carpenter mentions the case of a clergyman falling asleep in his pulpit during the singing of the psalm before the sermon, and awakening with the conviction that he must have slept for at least an hour, and that the congregation must have been waiting for him; but on referring to his psalm-book, he was consoled by finding that his slumber had lasted not longer than during the singing of a single line. Sir Benjamin Brodie, in his *Psychological Inquiries* (1854), mentions the following anecdote of the late Lord Holland: 'On an occasion when he was much fatigued, while listening to a friend who was reading aloud, he fell asleep and had a dream, the particulars of which it would have occupied him a quarter of an hour or longer to express in writing. After he woke, he found that he remembered the beginning of one sentence, while he actually heard the latter part of the sentence immediately following it, so that probably the whole time during which he had slept did not occupy more than a few seconds.' Many facts of the same kind are on record, and as the author from whom we have quoted remarks, 'if we were to pursue this subject, it would lead us to some curious speculations as to our estimate of time, and the difference between the real and the apparent duration of life.' It is from cases of this nature that Lord Brougham has been led to the opinion, that *all* our dreams really take place in the act of falling asleep or of awaking. We cannot, however, explicitly accept this doctrine. 1. There is no sufficient proof of its being true. 2. We have a proof to the contrary in the fact, that it is common for people to moan and even talk in the middle of a sleep; and every one who has kept a dog must frequently have observed him dreaming (from the outward manifestations which he makes in the form of snarling or growling), though he still remains asleep. Some, on the other hand, have argued that the mind can never be entirely inactive, and that every one is dreaming throughout the whole period of sleep, although the dreams may not be remembered in the waking state. We know of no facts that can be adduced in favour of this hypothesis, and the following case goes strongly to disprove it. A woman, aged 26, who had lost a portion of the scalp, skull, and dura mater, so that a portion of her brain was exposed to view, was a patient in 1821 in the hospital at Montpellier. When she was in a dreamless state, or in profound sleep, her brain was comparatively motionless, and lay completely within its bony case; but when the sleep was imperfect, and the mind was agitated by dreams, her brain moved and protruded from the skull, forming what is termed cerebral hernia. This protrusion was greatest when the dreams, as she reported, were most vivid; and when she was perfectly awake, especially if actively engaged in conversation, it attained its highest development, nor did this protrusion occur in jerks, alternating with recessions, as if caused by arterial action, but remained permanent while the conversation continued. If the *data* of this case are to be depended on, the appearance of the brain during profound sleep seems to indicate that during that state there is a total or nearly total suspension of the mental faculties.

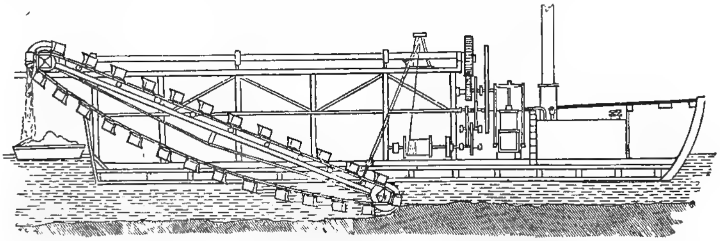
The author of *Psychological Inquiries* suggests the question: Do dreams answer any purpose in the economy of living beings? We regret that he has not given us a very definite answer, but he obviously inclines to the view that they cannot be purposeless. No one has hitherto offered any certain explanation of the uses of the spleen, of the thyroid gland, or of the supra-renal capsules; yet no one believes the formation of these organs to be merely incidental, or doubts that they have some special (although at present unknown) function to perform. 'Dreams are,' he observes, 'at anyrate, an exercise of the imagination. We may well conceive that one effect of them may be to increase the activity of that faculty during our waking-hours, and it would be presumptuous to deny that they may not answer some purpose beyond this in the economy of percipient and thinking beings.'

Dreams have, in all ages and countries, been believed in as indications of the future; and of all forms of superstition, this is perhaps the most excusable. Whatever is mysterious as to its cause, and beyond the power of the will, appears as supernatural; and what more so than dreams! The thoughts in dreams, too, arise out of the past and present circumstances of the dreamer, and therefore are not altogether without connection with his future destiny, as most other omens are. In the Homeric age, it was firmly held that 'dreams come from Zeus.' In the most ancient civilised communities of which we have any record—those of Egypt and Babylon—to interpret the monarch's dreams was one of the most important state offices, and was confided to a college of wise men. A common way of consulting the Greek and Roman oracles (q. v.), was for the inquirer to sleep a night in the temple, after performing sacrificial and other rites, when his questions were supposed to be answered in dreams. Grave philosophers wrote treatises on the interpretation of dreams, as they did on astrology. Even Bacon, although he confesses that the interpretation of dreams is mixed with numerous extravagances, yet speaks as if he thought that something might be made of it. In modern times, and among European nations, dreams are seldom heeded except by the very ignorant or superstitious; and 'as idle as a dream' has become a proverb. Nothing can be conceived more arbitrary than the pretended rules of interpretation; e. g., 'that to dream of gold is good-luck, but of silver ill.' See Brand's *Popular Antiquities*, by Ellis, where a 'Dictionary of Dreams' is given. As to the actual coincidences that sometimes happen between dreams and events, it is only surprising, considering the countless fancies that are passing through our minds while asleep, that the coincidences are not ten times more numerous than they are.

**DRED SCOTT CASE.** This was a case brought for final decision before the supreme court of the United States in 1856, which excited much interest in America as well as in Europe. The plaintiff was a negro named Dred Scott, who, with his wife and two children, had been held as slaves by a Dr Emerson, in the state of Missouri. After the death of Emerson, Dred Scott with his family claimed to be free, on the ground that they had resided for some time with their late proprietor in a free territory—so that having, as Scott alleged, been free in that territory, they could not now be held to slavery. The result of the litigation was, that Dred Scott and his family did not become free by having been taken to a free territory, and were accordingly still held to be slaves.

**DREDGE,** a machine for dragging or dredging the bottom of seas, rivers, or lakes, in order to bring up oysters and other animals that lie on the bottom. The common oyster-dredge is a bag-net, made of iron rings, linked together to form the meshes; the mouth is made of sheet-iron, which acts as a scoop when the dredge is let down and drawn along the bottom as the boat sails on. The dredge has of late been very extensively used by the naturalist with very important results, among the most remarkable of which are those obtained by the late Professor Edward Forbes, shewing the existence of zones of animal life corresponding with different depths of the ocean. The naturalist's dredge is of a lighter construction than that of the oyster-fisher, and its meshes should be smaller. For dredging a sandy bottom, the best form of dredge is one like the net used by the Kentish shrimpers. These are twine-nets, bag-shaped, and of the length of the boat. The lower side of the mouth of the net is stretched upon a wooden pole, and the other side is held up while the lower is drawn along the bottom. The quantity and variety of animals drawn up by these large shrimp-nets are astonishing. The dredge used for catching soles is similar in construction to the shrimp-net; but all dredges must be modified to suit the bottom on which they are used.

**DREDGING-MACHINE,** a machine used for clearing out or deepening the channels of rivers, harbours, &c. Dredging-machines are variously constructed, the simplest being like the oyster-dredge described above, only having a perforated cowhide bag instead of the chain-net, and a stronger 'spoon' or iron mouth to the bag. This is attached to the end of a pole, and worked with tackle by men from a barge in such a manner that the loose matter of the bottom is scooped up into the barge. The bucket dredging-machine is much more efficient. It consists of a long stage or framework overhanging the side of the barge. This frame has a wheel at each end, upon which works a powerful endless chain, to which is attached a series of perforated iron buckets, each with a shovel-shaped steel mouth projecting considerably on one side. The overhanging framework forms an inclined plane, along which the buckets run, descending on one side, and ascending on the other. They are so arranged that they descend empty, and on reaching the bottom, the projecting shovel or scoop-mouth digs into the bottom, and partially fills the bucket with the silt; it then turns round on the wheel at the lower end of the incline, and runs up it till near the top, when it turns over the upper end, and in doing so its contents are emptied into a second attendant barge. This action is continued by every succeeding bucket of the endless chain. The perforations are for the passage of the water. By varying the inclination of the framework, the working depth may be increased or diminished. The machine may be set in motion by a steam-engine, by a horse walking round a circular path on the barge, or simply by the action of the tide upon a large undershot water-wheel, the barge being moored, and the stream passing under it. Perhaps nowhere has river-dredging been carried such a length as in the case of the Clyde, which, by this process of scooping, has at and below Glasgow been converted from a river navigable only for small vessels into an estuary capable of bearing the largest ships. The dredgers employed for this purpose are moved by steam, the materials scooped out being carried off by lighters, which are attached. A dredger of this kind, just adapted to the cleansing of the harbour at Greenock (1861), is of the following dimensions: The hull is of iron, 110 feet in length by 23 feet in breadth. The frame for buckets, on which there are 37, is 70 feet, and is capable of dredging to a depth of from 27 to 30 feet.



Section of a Dredging-machine.

**DREI'SSENA,** a genus of lamellibranchiate molluscs, generally regarded as belonging to the mussel family (*Mytilidæ*), although, whilst the shell very much resembles that of the true mussels, the animal differs in having the mantle closed except at the anal and branchial slits, and a small aperture through which the foot and byssus protrude.—*D. polymorpha* is an interesting mollusc, because, having of late been accidentally introduced into British estuaries and canals, it has fully established itself, and is now abundant in many of them, and in the rivers with which they are connected. Originally, it is believed, a native of the rivers which flow into the Caspian Sea and Lake Aral, it has extended to the canals and rivers of Germany, Holland, &c. It is capable of living a long time out of water with its valves closed, and it is supposed that it may have come to Britain on timber imported from the continent.

**DRE'NTHÉ**, a frontier province of the Netherlands, is bounded on the E. by Hanover, on the N. and E. by Groningen, on the W. by Friesland, and on the W. and S. by Overyssel, in lat. 52° 37′—53° 23′ N., and long. 6° 12′—7° 10′ E. Area, 1017 square miles. Pop. 94,472. The soil is in general poor, only about one-half of the surface being capable of cultivation, the remaining portion covered chiefly with heath and morass. The principal crops are rye and buckwheat, but barley and oats are also raised. The inhabitants are chiefly employed in agriculture, pasturage—the cattle reared in D. being famous—and in digging and exporting peat. Two pauper colonies in the west of the province, the Fredericksoord and Willemsoord, established in 1818, are employed by the state in bringing waste land under cultivation, and in brick-making, weaving, and other occupations.

**DRESDEN**, the capital of the kingdom of Saxony, situated in a charming valley on both sides of the Elbe, in lat. 51° 3′ 16″ N., and long. 13° 44′ E. It is 116 miles south-east of Berlin, and 72 miles east-south-east of Leipsic. It is composed of the Altstadt (Old Town), on the left bank of the Elbe; and of the Neustadt (New Town), on the right or northern bank. D. is a pleasant, though not exactly a beautiful town. It contains several open squares both in the Old and New Towns. Pop. 117,750. On account of its architecture and splendid collections in art, it has been justly called the 'German Florence.' Of the churches, the finest are the Frauenkirche, with a tower 335 feet in height; the Roman Catholic Church (1737—1756), with a celebrated organ by Silbermann, and numerous statues and pictures; the Sophienkirche; and the Kreuzkirche, with an altar-piece by Schönau. The synagogue of the Jews, built in the oriental style by Semper, is also worthy of mention. Among the other important buildings may be mentioned the Royal Palace, a shapeless edifice, begun by Duke George, 1534, and completed by Augustus II.; the Prince's Palace, erected by Augustus II. in 1718; the Zwinger, only the vestibule of a palace in the almost too elaborate old French style of architecture, but containing many valuable antiquarian and scientific collections; the theatre, the academy, the Brühl Palace, &c. The Old and New Towns are connected by two bridges, both *chefs-d'œuvre* of architecture.

D. possesses many excellent educational and charitable institutions. The Academy of Art opened in 1764, to which a school of architecture was added in 1819. This celebrated institution and the musical choir render D. of no small importance to the progress of art in the present day.

The most important branches of industry are gold and silver manufactures, straw-plait, paper-hangings, excellent painters' canvas, colours, artificial flowers, chocolate, porcelain, &c. An impulse was given to the corn-trade by the opening of the Corn Exchange in 1850.—The environs of D. are delightful.

The most important of the D. collections are: 1. The Royal Public Library in the Japan Palace, amounting to nearly 300,000 volumes. It contains many curiosities, and is particularly complete in the departments of literary history and classical antiquity, as well as in histories of France and Germany. 2. The Cabinet of Coins, likewise in the Japan Palace. 3. The Museum of Natural History in the Zwinger, particularly complete in the mineralogical department. 4. The Historical Museum, formed in 1833. 5. The collection of mathematical and physical instruments, likewise in the Zwinger. 6. The renowned Picture-gallery, containing upwards of 1500 paintings, mainly by Italian and Flemish masters. Among the former, those especially worthy of notice are the pictures of Raphael ('The Sistine Madonna'); of Correggio ('La Notte,' and the 'Madonna of St Sebastian'); of Titian ('The Tribute-money,' and 'The Venus'); of Andrea del Sarto ('Abraham's Sacrifice'); of Francia; of Paul Veronese; of Giulio Romano ('The Virgin with the Pitcher'); of Leonardo da Vinci ('Francesco Sforza'); of Garofalo, Bellino, Pietro Perugino, Annibale Caracci, Guido Reni, Carlo Dolci, Cignani, &c. Of the Flemish school, the collection boasts 41 pictures by Rubens, 21 by Vandyck, many by Rembrandt, admirable specimens of Snyders, Johann Breughel, Ruysdael, Wouvermann, Gerard Dow, Teniers, &c. Of works of the German school, the gem of the collection is Hans Holbein's Madonna. Of the French school, several pictures by Nicolas Poussin, and some admirable landscapes by Claude Lorraine, are the most remarkable. 7. The Cabinet of Engravings in the Zwinger is arranged in twelve classes, marking distinct periods in the history of art. 8. The collection of Antiques in the Japan Palace, including several admirable sculptures. 9. The 'Green Vault' in the Royal Palace, a valuable collection of precious stones, pearls, and articles wrought in gold, silver, and ivory. 10. The collection of Porcelain in the Japan Palace.

D. is known in history as far back as the year 1206. It is officially mentioned as a town in 1216. Henry the Illustrious selected it for his capital in 1270. From the close of the 15th c., its prosperity gradually increased. Several successive sovereigns contributed to its embellishment, particularly Augustus I. and Augustus II. It suffered severely, however, during the Seven Years' War; and again in 1813, when Napoleon selected it as the central point of his operations. During the revolution of 1849, also, immense damage was inflicted upon the town, but it is again rapidly improving.

**DRESDEN, Battle of.** In August 1813, when the war between Napoleon and the allies, after a short truce, broke out afresh, the armies of the latter gathered from all sides towards Dresden, which they regarded as the key of the French position. It was held by St Cyr with a force of about 30,000 men, the main body of the French under Napoleon being in Silesia, where the emperor expected the contest was to be waged. On the 23d, the grand army of the allies appeared before Dresden. Previous to this, however, couriers had been despatched to Napoleon urging him to return. The town would in all probability have been quickly stormed, had not Schwarzenberg and the Austrians insisted on waiting the arrival of the left wing under Klenau. This delay saved the French, for at half-past nine, on the morning of the 26th, Napoleon with his Guards entered the town. All day the French troops poured into the town under a frightful fire of balls and bombs. At four o'clock in the afternoon, Schwarzenberg, the commander-in-chief of the allies, gave orders for the attack. A hundred guns vomited forth their deadly contents on the batteries and buildings of the beautiful city, while six deep and massive columns advanced in the finest order against the redoubts. At various points, the assault was irresistible, but the opportune arrival of the 'Young Guard' enabled Napoleon to hazard a sally, which was as unexpected as it was successful. The allies fell back everywhere; but not dispirited, renewed the fight next day. Towards noon, Moreau was mortally wounded by a cannon-ball at

Alexander's side on the height of Räcknitz, and Napoleon obtained a decided advantage over the left wing of the allied army, which Murat, by a skilful manœuvre, contrived to outflank, taking 10,000 prisoners, among whom was General Metsko. Several other successes in other parts of the field determined the allied armies, especially after hearing that Vandamme was advancing towards Pirne, to retreat, which they did during the night of the 27th August. Dresden, however, was not yet delivered from the miseries of war. When Napoleon finally quitted the city on the 7th October, nearly 30,000 men still remained behind. As all access was cut off by the Russians, the city suffered severely from famine. A capitulation was at length brought about (11th November 1813) between St Cyr and Klenau, according to which the garrison were to withdraw unmolested from the 12th to the 16th November, on condition that they laid down their arms. The capitulation was nevertheless rejected by Prince Schwarzenberg, the garrison declared prisoners of war, and treated as such. The battle of Dresden, as Alison observes, was the *last* pitched battle, on a scale commensurate with his former victories, that Napoleon ever gained.

**DRESS**, the collective name for the artificial coverings worn in greater or less quantity by all but the most savage of the human race, and always combining the two objects of warmth and ornament. It seems, indeed, from what we read of savage nations, that it is rather in the desire for ornament that the wearing of dress begins, than with a view to protection from cold (see FASHION, under which head some notice will be given of the more singular caprices to which the forms of dress have been subjected; see also CRINOLINE, BLOOMERISM). The earliest coverings would consist of such articles as the skins of animals, and the leaves and inner bark of plants, which, as civilisation advances, are mostly supplanted by various textures of wool, flax, silk, and other vegetable and animal substances. Some account of these textures is given under the appropriate heads, and the regulation of dress with a view to health is treated under HEALTH. As will be shewn more fully under FASHION, the tendency in modes of dress—notwithstanding occasional aberrations—is towards simplicity and appropriateness.

**DRESSINGS**, in Architecture, is a term loosely used to signify mouldings and all the simpler kinds of sculptured decorations.

**DREUX**, an ancient town of France, in the department of Eure-et-Loir, is situated on the river Blaise, 22 miles north-north-west of Chartres, and 45 miles west of Paris. It is tolerably well built, and lies at the foot of a hill crowned with the dilapidated ruins of an ancient castle, formerly the possession of the Comtes de Dreux. From among the ruins rises a beautiful chapel, in the form of a Greek temple, surmounted by a cupola, erected by Louis Philippe. It contains the tombs of two of the children of Louis Philippe, and of others of his relations. The town-hall and the parish church, both handsome specimens of Gothic, are the only other buildings worthy of note. D. has extensive manufactures of coarse cloth, serge, &c., with a trade in sheep and cattle, also various tan-yards, iron-foundries, and dye-houses. Pop. 5342. In 1562, one of the bloodiest battles recorded in the religious wars of France took place at D., in which the Catholics, under the Constable Montmorency, defeated the Huguenots, and took their leader the Prince of Condé prisoner.

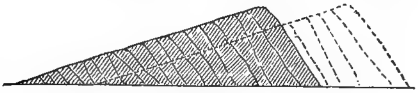
**DRIFFIELD, GREAT**, the chief town in the Wolds, in East Riding, Yorkshire, at the south base of these hills, near one of the sources of the Hull, 28 miles east-by-north of York, and 20 miles north-north-west of Hull. It lies in a fertile district, and consists chiefly of one long and broad street. It has a chemical work, flour, and bone-mills, and a considerable corn and cattle trade. Pop. (1861) 4000. Near D. many ancient tumuli have yielded human and horse skeletons, accoutrements, flint spear-heads, urns, and a variety of ornaments.

**DRIFT**, in Navigation, is a technical name for the deviation which a ship's course receives by the action of a contrary wind.

**DRIFT**, a name given to the boulder-clay, a deposit of the Pleistocene epoch. More fully, it is called the Northern Drift, Glacial Drift, or Diluvial Drift, in allusion to its supposed origin. For an account of the formation, see BOULDER-CLAY.

DRIFT-WOOD is wood carried by tides and currents to a distance from its native locality. Specimens thus transported have been observed in the marine strata of the Chalk, London Clay, and other formations.

SAND-DRIFT is sand driven and accumulated by the wind. Deposits thus formed are occasionally found among the stratified rocks, but compared with other strata they are few, though, from their anomalous character, an acquaintance with their phenomena is of importance to the geologist. Moving sands are at the present day, in many places, altering the surface of the land. In the interior of great dry continents, as Africa, India, and Australia, extensive districts are covered with moving sands. The continuous blowing of a steady wind in one direction often covers a rich tract with this arid material. But the influence of the wind on loose sand is most evident along low sandy coasts, where hills, called 'dunes,' are formed entirely of it; they sometimes attain a considerable height, as much, for instance, as 200 or 300 feet. Dunes are advancing on the French coasts of the Bay of Biscay at the rate of about 60 feet per annum, covering houses and farms in their progress. Similar accumulations are forming on the coasts of Nairn, Cornwall, Wexford, and other parts of the British Isles. The Culbin Sands, in Nairnshire, cover a large district which at a period not very distant was rich arable land. The prevailing wind is from the west, hence the hills are slowly moving in an easterly direction, at the rate of a mile in somewhat less than a hundred years. A singular stratification exists in these hills. The prevailing west wind lifts, or rather rolls the particles of sand up the gentle incline of the western aspect of the hill, until they reach the summit, where they fall, forming a steep declivity to the east, equal to the angle of repose for sand. A shower consolidates the surface of the new bed, or a land-breeze carrying fine dust separates it by a very thin layer of finer material from the one that follows, and thus, as the hill moves eastward, a regular series of strata is formed at a very high angle, as is shewn by the diagram. The progress of the hill is represented by the dotted outline. Little can be done to arrest the progress of these devastating sand-drifts. It has been recommended to plant *Carex arenaria* and similar sand-loving plants, which have long creeping roots: they certainly check to a considerable extent the influence of the wind.



Section of Culbin's Sand-hill, in Nairnshire.

**DRILL** (*Cynocephalus leucophæus*), a species of Baboon (q. v.), a native of Guinea, similar to the mandrill, but rather smaller and less ferocious.

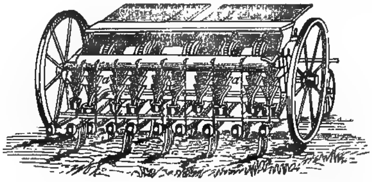
**DRILL** is a general name for the exercises through which soldiers and sailors are passed, to qualify them for their duties. It is subject to numerous varieties, according to the number and organisation of the men drilled at one time, and the kind of weapon to which the exercises relate. The infantry, the cavalry, and the artillery all have different kinds of drill. The militia and the volunteers differ from the regulars, if not in the kind of drill, at least in the circumstances under which it is carried on; the squad-drill, company-drill, and battalion-drill, vary both in the numbers concerned and in the routine of exercises. And so likewise in the navy, the drilling of seamen varies in kind, according to the duties likely to be required.

It is generally considered that four months' drill is required to fit an infantry recruit for service. The progress depends greatly on the intelligence of the men. It is on this ground that the Rifle Volunteers, enrolled in such large numbers in 1860, have been so advantageously placed; composed almost entirely of young men, whose intelligence has been developed by a moderately good education, the corps have advanced to a degree of proficiency which has attracted the marked attention of military officers.

Manuals of Drill have been prepared for all the various branches of the two services. Drill-grounds, as at Aldershott, are now sometimes made with roofs for shelter.

**DRILL**, a fine linen fabric of a satiny finish, used for summer dresses for gentlemen. Drills are worked with five shafts, except fancy patterns, which are wrought with eight shafts.

**DRILLING, DRILL.** Drilling is the name applied to the mode of sowing in regular rows, as distinguished from broadcast sowing, and the drill is the name of the implement employed in this process; the term *drill* is also frequently applied to a row of drilled crop, as a drill of potatoes, corn, or turnips. In all countries in which maize and Indian corn are grown, the principle of drilling has been long known and acted upon. In gardening it has been practised everywhere from time immemorial; but its extension to field-culture is comparatively of recent date. Jethro Tull invented a drilling-machine in the early part of last century, and did much to shew its merits in the culture of grain and root crops. Since his time, the use of this implement, in the case of both white and green crops, has in many districts become general. The crops which are now most generally drilled are clover, flax, cereals, beans, peas, potatoes, turnips, beet-root, cole-seed, and carrots. Of these, clover and flax are sown in drills at about 3 or 4 inches apart; cereals from 6 to 10 inches; and beans, potatoes, and turnips at from 25 to 28 inches apart; the general rule, however, with most green crops, being that the space between the rows should admit of the passage of a light plough or hoe, drawn by a horse, without danger to the plants. A great variety of drills are now in use. At present, that formed on the principle of lifting the grain in small cups, which empty themselves into tin tubes, by which the grain is conducted to the coulters, is chiefly used in the level parts of England. Garrett of Saxmundham, Suffolk, a cut of whose corn-drill is given, and Hornsby of Grantham, are favourite makers of corn and turnip drills. The usual English drills, however, are too heavy for the uneven soil of a great part of Scotland, and consequently a lighter, but otherwise less perfect machine, of a similar nature, and more suitable for hilly land, is made in the Lothians. One powerful recommendation of drilling is, that by means of it a considerable saving of seed is effected in the sowing of white crops; but the great advantage is, that in the case of green crops, it enables the farmer more readily to clean the land, both by the hand and by the horse-hoe. Drilling is of more importance in dry than in moist climates, as in the former, weeds are more apt to spring up, and injure the crops. To keep the soil stirred and pulverised, which can only be properly done where the crops have been drilled, favours the retention and absorption of the moisture. In sowing by drill, the seed being more evenly deposited beneath the surface, springs up with greater regularity, the straw is stiffer, and the ground is more easily cleaned until the crops cover it fully.



Garrett's Corn-drill.

In England, turnips are frequently drilled by a machine on the flat; while in Scotland, they are always sown on ridges or drills formed by the double-moulded plough, which, in consequence of its being used for forming wide ridges on which the turnips are sown, is called also the drill-plough. Some turnip sowing-machines or drills are so constructed as to be able to deposit manure and seed at the same time.

**DRILLS** are tools used for boring or drilling holes in metal, bone, ivory, hard woods, &c. They are usually made of a square steel bar, flattened out at the cutting end; this part is brought to an angular point like a spear-head, and the cutting edges forming the angle are bevelled in opposite directions. Those which have a projecting pin in the centre, and chisel-shaped cutting edges on each side of the pin, are called 'centre bits.' There are various contrivances by which the drill is made to revolve. For drilling iron, steel, and large brass work, the lathe is commonly used, the drill being fitted into a square-hole chuck, and the work pressed against it while revolving by the screw and centre of the puppet. The *brace* or *drill-stock* is commonly used by carpenters for centre bits, and occasionally for metal work. This is a curved handle, which is made to revolve by the hand, while one end is pressed against the chest. Small drills for metal work are mounted with a *ferule* or pulley, or are fitted into a stock with such a pulley on it; a piece of cane or spring-steel is mounted with a string like an archer's bow, but loose enough to wind round the ferule. By drawing the bow lengthwise, the drill is made to revolve, and is at the same time pressed against the work by means of a *breast-plate*, which is held against the chest of the workman; this breast-plate has indentations upon it, which serve as sockets, into which the end of the drill-stock or drill works.

**DRIMYS.** See WINTER'S BARK.

**DRINKING USAGES.** Some of these are of great antiquity, and all are interesting in connection with the history of manners. Besides sacrifices of animals and articles of food, the Hebrews made drink-offerings a solemn religious service. To mark the spot where he communed with God, Jacob set up a pillar of stone, and 'poured a drink-offering thereon.'—Gen. xxxv. 14. We learn that such sacrifices were not made alone to the true God; for women are said to have poured out 'drink-offerings unto other gods.'—Jer. vii. 18. Such a statement is amply verified by pagan writers. Among the Greeks and Romans, the pouring out of a libation to the gods was a common religious observance. A libation was made on the occasion of solemn prayers, and also before meals. These libations were usually of undiluted wine, but they were also sometimes of milk diluted with water, or water flavoured with honey. There are many references to these libations by Sophocles, Æschylus, Pliny, and other writers. The libation at meals consisted of pouring a small quantity of liquor from the cup on the ground—so much waste being a kind of propitiation, or an act somewhat equivalent to the asking of a blessing. See SACRIFICE.

From these and similar usages in remote times sprung the ceremonial observance of drinking healths, or the uttering of a pious, heroic, or friendly sentiment before quaffing liquor on festive occasions. It has been stated that the practice of pledging, or saying 'I pledge you,' originated in England in the 10th c., it being then necessary for one to watch over the safety of his companion when the cup was at his lips. But the custom of drinking healths, as just mentioned, is of far higher antiquity, and was derived immediately from the boisterous convivialities of a Scandinavian and Teutonic ancestry (see VALHALLA), if not with equal likelihood from the usages of the early Britons, who were of Celtic origin. A story is told of a feast given by Hengist (5th c.) at his stronghold of Thong-caster, in Lincolnshire, to the British king Vortigern, and of the bewitchment of the royal guest by the charms of Rowena, the young and beautiful daughter of his entertainer. Rowena's address, as she gracefully knelt and presented the wine-cup to the king, *Liever kyning, wass heal*, or, 'Dear king, your health,' is often quoted as the origin of our still existing expressions, wassail and wassail-cup; though wassail means pledging or health-drinking independently of the saying of Rowena, and certainly was not then uttered for the first time. Wassail is derived from the old Anglo-Saxon *Wæs hæl*, 'Be in health;' and *Wæs heil* and *Drinc heil* were the usual ancient phrases in quaffing among the English, and synonymous with 'Here is to you,' and 'I'll pledge you,' of later times. The explanation of wassail by an old writer, Robert de Brunne, may be appropriately quoted:

> 'This is ther custom and her gest
> When thei are at the ale or fest,
> Ilk man that levis qware him think
> Salle say *Wosseille*, and to him drink.
> He that biddis salle say, *Wassaile*,
> The tother salle say again, *Drinkaille*.
> That says Wosseille drinkis of the cop,
> Kissand his felaw he gives it up.'

The learned Selden, in a note on the *Polyolbion*, says: 'I see a custom in some parts among us; I mean the yearly Was-haile in the country on the vigil of the new year, which I conjecture was a usual ceremony among the Saxons before Hengist, as a note of health-wishing (and so perhaps you might make it Wish-heil), which was exprest among other nations in that form of drinking to the health of their mistresses and friends. "Bene vos, bene vos, bene te, bene me, bene nostram etiam Stephanium," in Plautus, and infinite other testimonies of that nature in him, Martial, Ovid, Horace, and such more agreeing nearly with the fashion now used; we calling it a health, as they did also in direct terms.' For further particulars concerning wassail and wassail-bowl, we may refer to Brand's *Popular Antiquities*, edited by Ellis. It is enough here to quote from that authority the following passages. 'Milner on an ancient cup (*Archæologia*, xi. 420), informs us that "the introduction of Christianity amongst our ancestors did not at all contribute to the abolition of the practice of wasselling. On the contrary, it began to assume a kind of religious aspect, and the wassel-bowl itself, which in the great monasteries was placed on the abbot's table, at the upper end of the refectory or eating-hall, to be circulated amongst the community at discretion, received the honourable appellation of 'Poculum charitatis.' This, in our universities, is called the grace-cup." The poculum charitatis is well translated by the toast-master of most of the public companies of the city of London by the words, a "loving cup." After dinner, the master and wardens "drink to their visitors, in a loving cup, and bid them all heartily welcome." The cup [a silver flagon containing warm spiced wine] then circulates round the table, the person who pledges standing up whilst his neighbour drinks to him.'

While the drinking of healths is thus of old date, the application of the word 'toast' is modern, having had its origin in the practice of putting a piece of toasted bread in a jug of ale, hence called 'a toast and tankard.' The custom of so using the word is said to have had its rise at Bath, in the reign of Charles II. It happened that on a public day a celebrated beauty of those times was in the cross [or large public] bath, and one of the crowd of her admirers took a glass of the water in which the fair one stood, and drank her health to the company. There was in the place a gay fellow half-tipsy, who offered to jump in, and declared, though he liked not the liquor, he would have the toast. He was opposed in his resolution; yet this whim gave foundation to the present honour which is done to the lady we mention in our liquors, who has ever since been called a toast.—*Tatler*. Begun in the form of toasting beauties at private parties, toasts were in time given on all sorts of subjects at public festivities, accompanied with rounds of cheers and hurrahs, these noisy demonstrations being now called 'the honours.' The fatigue of announcing these exciting sentiments is so great, that in all well-ordered large assemblies a toast-master is employed. Standing behind the chairman, this official, besides proclaiming the toasts, acts as a fugleman to regulate the clapping of hands and the 'hip, hip, hurrahs' of the company. 'Toasts, certainly, in this guise look more like a medium for taking an indefinite quantity of wine, than that spontaneous effusion of the heart in honour of some cherished individual, which they originally were. On certain occasions, these signals are hushed, and the convivial glass is taken "in solemn silence." The effect is certainly rather startling. A convivial glass to the memory of one departed has surely something in it of practical absurdity.'—Mrs Stone's *Chronicles of Fashion* (1845). The absurdity of the whole toasting system has incurred the reprehension of temperance societies, without any perceptible abatement; but the old custom of drinking healths at private parties is now given up in good society, along with the excesses which were formerly practised.

Space is not afforded in the present work to do more than glance at the diversity of drinking usages in connection with domestic events and social intercourse. There were, as is well known, at one time drinkings on the occasion of births, baptisms, marriages, and even deaths; these last, which included the gloomy festivities of the *Lyk-wake*, or wake over the corpse of the deceased, being a relic of a very ancient custom, as was that, at least in Scotland, of drinking the *dredgy* (dirge) after the funeral solemnities were completed. In whatever manner these, as well as many other drinking usages, originated, it cannot be doubted that they were long maintained from the force of custom, along with that demand for artificial stimulus provoked by the naturally phlegmatic character of a northern people. For the long nights of a cheerless climate, there seems to have been sought the solacement of those intoxicating agents, in which it would have been fatal to indulge—where they were not needed—under the sunny skies of the south. We believe this is really the philosophy of the subject, if there be any philosophy in it; and it cannot fail to be observed, that just in proportion to an increase in the number of comfortable homes, the cultivation of mental resources, and the spread of a taste for harmless recreations, the more odious of the old convivialities disappear. Latterly, many amusing traditions respecting the drinking habits of a past age in Scotland, where they longest flourished without alteration, have been given in the *Memoirs of Lord Cockburn*, the *Autobiography of the Rev. Dr Alexander Carlyle*, and the *Reminiscences of Changes in Social Life in Scotland*, by the Very Rev. Dean Ramsay (1860).

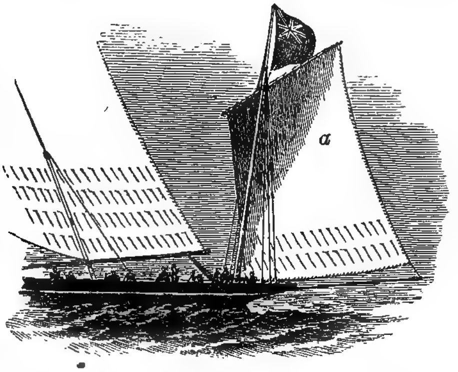
As regards miscellaneous drinking observances at one time common, we can refer but to a few of the more prominent. Perhaps the most offensive of all was that customary among tradesmen of imposing fines to be consumed in liquor. Apprentices, on being introduced to a workshop, paid so much entry-money to be spent in drink, and similar exactions were made from journeymen on entering a new employment. This was called paying their *footing*. When Benjamin Franklin, on his getting employment in a printing-office in London, refused to comply with this mischievous custom, he experienced, as he tells us, a variety of petty annoyances. Among shipwrights, the penalty of non-payment was flogging with a hand-saw from time to time, and other maltreatment. We refer to Dunlop's *Drinking Usages of Great Britain* (1839) for many curious details of this kind. Happily, the abolition of these usages has kept pace with the increasing intelligence of the working-classes, and of such outrages little is now heard. Prisoners, on being lodged in jail, as related in the novels of Smollett and others, were obliged to pay *garnish* for drink to the brotherhood of which they had become members. This pitiless exaction is now totally gone, through the efficacy of modern prison-discipline.

The giving of *vails* (Lat. *vale*, farewell) to servants on quitting a gentleman's house, which became so intolerable in the 18th c., as at length to be given up by universal consent, meant, doubtless, a gift to be spent in drink to the health of the donor, and was analogous to the custom of giving a *trink-geld* in Germany, and a *pour boire* in France, to servants, drivers of carriages, and others. There were, at one time, numerous drinking usages connected with departures. We need only notice the *bonailie* (Fr. *bon allez*), or, as it is sometimes called, a *foy* (Fr. *voie*), a festive drinking at the away-going of servants or of persons in a still higher degree, once common in the Lowlands of Scotland; also the *stirrup-cup*, or, as it is called in the Highlands, *deoch an dorris*, or drink on getting on horseback, and being ready to set off.—For the moral and physical evils connected with drinking usages, and the means taken to redress them, we refer to the article TEMPERANCE. W. C.

**DRIP**, the projecting edge of a moulding, so channelled as that the rain will drip from it instead of trickling down the wall.—*Parker.*

**DRI'PSTONE** (Fr. *larmier*). The dripstone is a projecting moulding or tablet placed over the head of a Gothic doorway or window, for the purpose of throwing off the water, whence it is also known as a water-table or weather-moulding. Though such was, no doubt, its primitive use, the dripstone latterly became a mere ornamental appendage, which served to enrich and define the outline of the arch. It does not generally extend lower than the springing of the arch, though this rule is by no means without exceptions. When the tracery extends to a lower level, the external dripstone usually accompanies it, and Parker mentions that, at the north doorway of Otham Church, Kent, it descends the whole length of the jamb. The dripstone is not so constant a feature in continental as in English Gothic.

**DRIVER**, on shipboard, is the name of a large sail, occasionally set upon the mizzen yard or gaff. A boom, called the *driver-boom*, extends the foot of the sail a good way over the stern, like a cutter's mainsail.



*a*, the Driver.

**DRIVING**, FURIOUS. This, which was always an offence at common law, was made a statutory offence by 1 Geo. IV. c. 4, which provides that if any person shall be maimed, or otherwise injured, by reason of the wanton and furious driving or racing, or by the wilful misconduct of any coachman, or other person having the charge of any stage-coach or other public carriage, the offender shall be guilty of a misdemeanour, and punishable by fine and imprisonment. Special penalties are imposed by the general and local Road Acts; and 2 and 3 Will. IV. c. 120, by which the laws relating to stage carriages and horses let for hire were consolidated, enacts that any driver, conductor, or guard, guilty of furious driving, shall forfeit £5 (s. 48). The owners are liable for the penalty where the driver or guard is not known, or cannot be found. As to cabs, see HACKNEY CARRIAGES. Within the metropolis they are regulated by 1 and 2 Will. IV. c. 22, 1 and 2 Vict. c. 79, and 16 and 17 Vict. c. 33.

**DRO'GHEDA** (Ir. 'bridge of the ford'), a parliamentary and municipal burgh and seaport, in a county by itself of nine square miles, on the borders of Meath and Louth, on both sides of the Boyne, 4 miles from its mouth, and 31 miles north of Dublin. It is well built. The chief part of the town is on the north bank of the river, and on higher ground. The Dublin and Belfast Railway crosses the Boyne here by a viaduct 95 feet high. There are linen and cotton manufactures, tanning and brewing works, and an iron foundry. It has a considerable trade, chiefly with Liverpool, 140 miles east-south-east. Its chief exports are corn, meal, flour, cattle, provisions, linen, hides, and butter. Great quantities of ale are sent to the colonies. Vessels of 500 tons reach the quay, and barges of 50 tons ply 19 miles up the Boyne to Navan. Pop. (1861) 18,094. D. sends one member to parliament. The parts of D. on the opposite sides of the river formed two opposing corporations till 1412, when a sermon by a monk induced them to get a charter of union from Henry I. From the 14th to the 17th c., D. was the chief military station in Ulster. Many Irish parliaments were held here in the 15th c., and D. had then the right to coin money. In 1649, Cromwell stormed D., and put 2000 of the garrison to the sword. Poyning's laws were enacted here. D. surrendered to William III. the day after the battle of the Boyne, which was fought in 1690 at Oldbridge, four miles west of Drogheda. Some buttresses, and two of the four gates of D., still remain. There are here the ruins of many friaries and monastic institutions. In 1860, 1362 vessels, of 226,192 tons, entered and cleared the port.

**DROGUE AMÈRE** (Fr. bitter drug), a celebrated stomachic bitter; of which the basis is creat root, and the other ingredients are mastic, frankincense, myrrh, and aloes, all steeped for about a month in brandy, which is then strained and bottled.

**DRO'HOBICZ**, a town of Austria in the province of Galicia, is situated on the Tyszmanika, a tributary of the Dniester, in lat. 49° 25′ N., and long. 23° 30′ E. The town is in general ill built, but it contains several interesting edifices, including a Basilian monastery, a castle, a high school, and two very handsome churches. D. has extensive salt-works, which produce about 3700 tons of salt yearly. There are also in the vicinity iron-mines and pitch-wells. D. has likewise a good trade in wine, linen, cotton, leather, and grocery. It has, besides, corn and cattle markets. Pop. about 10,000, seven-eighths of whom are Jews, who carry on most of the commerce of this town.

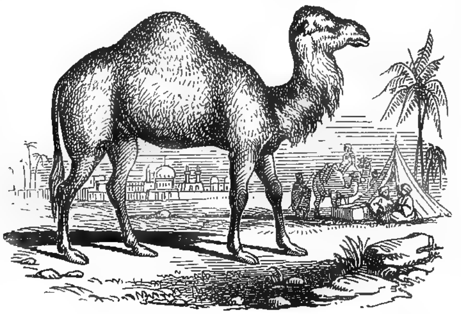
**DROIT D'AUBAINE** (Lat. *alibi nati*). By the old custom of France, the king was entitled, on the death of a foreigner who had taken up his fixed residence there, to claim his movable estate, notwithstanding any testamentary settlement which he might have left. But when a foreigner went to France as a traveller, merchant, or foreign minister, without any intention of fixing his residence there, the droit d'aubaine was excluded. The Swiss, Savoyards, Scotch, and Portuguese were exempted. This antiquated piece of injustice was abolished in 1819.

**DROITS OF THE ADMIRALTY.** See ADMIRALTY DROITS.

**DROI'TWICH**, a parliamentary and municipal borough in Worcestershire, containing four parishes and three churches, seven miles north-north-east of Worcester, in the narrow valley of the small river Salwarp, on the Bristol and Birmingham and West Midland Railway, and on a canal connected with the Severn, which admits vessels of 60 tons. It has direct communication, also, by means of other canals, with Birmingham and London and the intermediate district. Its chief trade is salt, for which it has been famous from remote times, and which is esteemed the best in Europe. In the middle of the town, rising from a depth of 200 feet, through beds of new red-sandstone and gypsum, are the celebrated wyches, or brine-springs, yielding 100,000 tons of salt a year, nearly the half of which is exported to foreign countries. Pop. (1861) of the municipal borough, 3123; of the parliamentary, 6540. D. sends one member to parliament. It was the Roman Salinæ. The remains of a Roman villa were found here, with tesselated pavements, coins, medals, and fibulæ.

**DROME**, a department of France, on the east bank of the Rhone, to the south of the department of Isere. Area, 2496 square miles. Pop. 324,760. In the west of the department, running from north to south along the Rhone, stretches a sandy plain of from five to eight miles in breadth, but toward the east the surface is hilly; a spur of the Alps traversing the eastern boundary, and sending offshoots of about 3500 feet in average height westward across almost the entire area of Drome. These heights, whose sides are covered with forests of pine, oak, and beech, afford excellent pasturage in summer and autumn. The general direction of the rivers of D. is westward, toward the Rhone, and the most notable of them are the Drome, from which the department takes its name, and the Isere. Vines and mulberry, chestnut, walnut, and olive trees are extensively grown. About 8,600,000 gallons of wine are produced annually. Many of the vineyards are famous, but perhaps the most celebrated is that of L'Hermitage, near Tain, on the banks of the Rhone, which yields red and white wines hardly surpassed by any in the world. D. has several iron-mines, also copper, lead, and to some extent coal. The manufactures consist chiefly of woollen cloth, silk, hosiery, serge, and cotton yarn. The department is traversed by the Lyon and Avignon Railway. It is divided into the four arrondissements of Valence, Montélimart, Die, Nyons, with the town of Valence for capital.

**DRO'MEDARY**, a name sometimes given, probably at first through mistake, to the Arabian or one-humped camel (*Camelus dromedarius*), but properly belonging to a variety of that species, distinguished by slenderness of limbs and symmetry of form, and by extraordinary fleetness. It has been well described as 'bearing much the same relation to the ordinary camel as a race-horse or hunter does to a cart-horse.' The word dromedary is derived from the obsolete Greek *dremo*, to run. The pace of the D. is a trot, which it can maintain without intermission for a prodigious length of time; often at the rate of nine miles an hour for many hours together; whilst a journey of upwards of 600 miles is performed at a somewhat slower rate in five days. Even its more rapid pace can be maintained for twenty-four hours at a stretch, without sign of weariness and without stopping to bait; and if then it is allowed a little refreshment, of a ball of paste made of barley and powdered dates and a little water or camel's milk, it will resume its journey, and go on with undiminished speed for twenty-four hours more. The jolting to the rider is terrible. The gallop is a pace unsuitable to the D., and at



Dromedary.

which it very soon fails. Dromedaries are sometimes trained to run races. White dromedaries are particularly prized in some parts of the East. See Camel.

**DROMO'RE** (*Druim Mor*, Great Ridge), an Episcopal city in the north-west of the county of Down, on the Lagan, 14 miles south-west of Belfast. It has linen manufactures. Pop. (1861) 2526. In the peat-bogs here were found the remains of an elk, the space between the extremities of whose horns measured 10 feet 3 inches. North of D. is a mound or rath, 60 feet high, with three concentric intrenchments, and great outworks towards the Lagan. The see of D. was founded by St Colman in the 6th c., but is now united with those of Down and Connor. Jeremy Taylor, when bishop here, built the present church.

**DRONE.** See Bee.

**DRO'NTHEIM.** See Throndhjem.

**DROORAJAPATA'M**, or **DOOGOORAUZEPATA'M**, a town on the Coromandel coast of Hindustan, possesses remarkable facilities for navigation, both maritime and inland. It stands on an inlet, which connects Blackwood Harbour with Pulicat Lake, the former being the only safe haven on the west side of the Bay of Bengal, and the latter being artificially continued as far as Madras. The place is 60 miles to the north of Madras, and 34 to the south of Nellore, in lat. 13° 59′ N., and long. 80° 13′ E.

**DRO'PSY** (Gr. *hydrops*, from *hydōr*, water), a class of diseases always of serious import, though not often, perhaps, directly fatal. D. is rather a symptom than a disease; it consists of the effusion of watery fluid from the blood into the skin and subjacent textures, or into the cavities of the body. When the effusion is chiefly in the superficial parts, the dropsy is called Anasarca (*ana*, upon; *sarx*, the flesh); when it is in the abdomen, it is termed Ascites; when in the chest, Hydrothorax. Dropsy most commonly depends on disease of the heart (q. v.) or kidneys (q. v.); in cases of ascites, the liver and spleen are often at fault. The treatment of dropsy is chiefly by diuretics (q. v.), and other evacuant remedies, which remove the fluid from the textures by unloading the blood of its excess of serum. It is, however, a matter of some difficulty to find the proper remedy in each individual case. In all cases of dropsy, the internal organs should be, if possible, submitted to a strict medical examination, and the treatment regulated accordingly.

**DRO'PWORT.** See Spiræa and Water Dropwort.

**DROSERA'CEÆ**, a natural order of exogenous plants, consisting entirely of herbaceous plants, which generally inhabit marshy places, and are often covered with glands. The leaves are frequently all radical, and they and the flower-stalks are rolled up in bud like the fronds of ferns. There are five sepals, five petals, five, ten, fifteen, or twenty stamens; the fruit a one-celled capsule, with numerous seeds. About 100 species are known, distributed over most parts of the world, many of them plants of very delicate appearance; and many of them, as the species of *Drosera* or Sundew, natives of Britain, are remarkable for their glandular hairs, which secrete a viscid fluid, and by means of it often fatally detain flies which alight on them. *Rosidula dentata* is placed in houses in South Africa on this account. Venus's Fly Trap belongs to this order. See Dionæa. Acrid and stimulant properties prevail in the Droseraceæ.

**DROSTE-HÜLSHOFF**, Annette Elizabeth, a distinguished lyric poetess of Germany, born 12th January 1798, on the estate of Hülshoff, near Münster. Of a delicate constitution, and living in complete seclusion from the world, she nevertheless received an excellent scientific education. In the year 1825 she was first introduced into a wider circle of distinguished men and women at Cologne and Bonn, but in a short time retired again to her maternal estate of Rischhaus, near Münster, where she lived almost exclusively for science, nature, and poetry. She died at a place near Lake Constance, 24th May 1848. While occupying a distinguished place among the literary women of the time, she retained all the characteristic timidity of her sex, avoiding those eccentricities into which many women fall who think they have a mission to regenerate society. Her *Gedichte* (Poems) appeared at Stuttgard in 1844, and of her posthumous works *Das geistliche Jahr nebst einem Anhang religiöser Gedichte* at Stuttgard in 1852. The poems are not only perfect as regards form, but unite a womanly gentleness and poetical creative power in a degree seldom seen in the writings of women.

**DROUET**, Jean Baptiste, Comte d'Erlon, French marshal, was born 29th July 1765, at Rheims, entered a regiment of volunteers in 1792, and took part during the years 1793—1796 in the campaigns of the Moselle, Meuse, and Sambre. His important services quickly obtained him promotion. His conduct in the peninsular war was highly distinguished, and elicited the warmest eulogiums from Massena. After the fall of Napoleon, the Bourbons tried to secure his services, and gave him the command of the 16th division, but he was shortly after arrested on the charge of conspiring against the royal family. Managing to escape, he remained in concealment in Lille until the return of Napoleon from Elba, when, putting himself at the head of the troops, he seized the citadel and held it for the emperor, who made him a peer of France. At the battle of Waterloo he commanded the first *corps d'armée*. After the capitulation of Paris, he fled to Bavaria, where he resided until the July revolution, when he returned to France, and received in 1832 the command of the army of Vendée. During 1834—1835, he held the important office of governor-general of Algeria, and in 1843 was elevated to the rank of marshal. D. died 25th January 1844.

**DROUYN DE LHUYS**, Edouard, an eminent French diplomatist and politician, was born at Paris, November 19, 1805, and studied at the college of Louis-le-Grand and the Ecole de Droit. He was at first attached to the embassy at Madrid, whither he proceeded in 1830. In 1840 he was placed at the head of the commercial department under the Minister of Foreign Affairs, and shortly after was elected *député* for Melun; but taking a part hostile to the government, of which he was a subordinate member, he was deprived of his situation by M. Guizot. This gave him fuller scope for the advocacy of his political opinions. He now became an active member of the *Reforme* party, and after the famous banquet of the 12th arrondissement had been interdicted, he signed, along with the other chiefs of the opposition, the accusation drawn up against M. Guizot and his colleagues. Elected representative of the people to the Constituent and Legislative Assemblies, by the department of Seine-et-Marne, he was made first a member and then president of the Committee of Foreign Affairs. Here he acted generally with the moderate party. In the first cabinet formed by Louis Napoleon after his election to the presidency

(December 1848), he became Minister of Foreign Affairs, and directed the French policy in all the difficult European complications of the year. In 1849 he went to London for a short time as ambassador, and after the *coup d'état* became one of the vice-presidents of the Imperial Senate. He took part also in the Vienna conferences of 1855 relative to the Crimean war, but being reluctant to advance the war-policy of his master, he resigned his office, and subsequently withdrew from the senate altogether.

**DROWNING.** See Asphyxia.

**DROWNING**, as a mode of capital punishment, has only lately ceased in Europe, and is probably still in use in some other quarters of the world. Tacitus, writing about the end of the 1st c., tells us that the Germans hanged their greater criminals, but that meaner and more infamous offenders were plunged under hurdles into bogs and fens. By the law of the ancient Burgundians, a faithless wife was to be smothered in mud. The Anglo-Saxon codes ordered women convicted of theft to be drowned. The punishment was in such common use throughout the middle ages, that grants of capital jurisdiction ran '*cum fossa et furca*,' i. e., 'with pit and gallows.' The pit, ditch, or well, was for drowning women; but the punishment was occasionally inflicted on men. The doom of the parricide was to be put into a sack and cast into the sea. A canon of Prague, afterwards enrolled in the catalogue of saints, was drowned in 1383, for refusing to reveal the secrets of the confessional. In this instance, perhaps, drowning was allowed to the offender as a matter of favour. So in Scotland, in 1556, a man convicted of theft and sacrilege, was sentenced to be drowned, 'by the queen's special grace.' So lately as 1611, a man was drowned at Edinburgh for stealing a lamb. By that time, the punishment of drowning had become obsolete in England. It survived in Scotland until 1685. The last execution by drowning in Switzerland was in 1652, in Austria in 1776, in Iceland in 1777. It was abolished in Russia early in the 18th century. In Saxony, a woman convicted of child-murder, was sewn up in a sack, along with a cat, a dog, and a snake, and thus drowned, in 1734.

**DRU'GGET**, a common felt or other coarse woollen fabric, chiefly used for covering carpets, or as a substitute for a carpet. At one time, also, it was largely used as an article of clothing by the humbler classes, and even yet the *drugget petticoat* is far from uncommon, although it is gradually giving place to cotton fabrics, which have the advantage of greater cleanliness, and of being less liable to retain infectious and contagious poisons.

**DRUGS**, a name applied to all material agents used in the treatment of disease, when in their crude or commercial forms. The medicines ordered by the physician consist of drugs prepared by the apothecary or chemist, and made up according to the prescription (q. v.). The business of the druggist is now to a considerable extent separated from that of the medical practitioner, with which it was formerly associated. See Chemists and Druggists, and Apothecaries.

**DRU'IDISM.** This institution was, perhaps, common to all Celtic nations, but we have detailed accounts only of the form under which it existed in Gaul. Cæsar gives the following description of the character and functions of the Druids: 'They attend to divine worship, perform public and private sacrifices, and expound matters of religion. A great number of youths are gathered round them for the sake of education, and they enjoy the highest honour in that nation; for nearly all public and private quarrels come under their jurisdiction; and when any crime has been committed, when a murder has been perpetrated, when a controversy arises about a legacy, or about landmarks, they are the judges too. They fix rewards and punishments; and should any one, whether a private individual or a public man, disobey their decrees, then they exclude him from the sacrifices. This is with them the severest punishment. The persons who are thus laid under interdict are regarded as impious and wicked people; everybody recoils from them, and shuns their society and conversation, lest he should be injured by associating with them. They cannot obtain legal redress when they ask for it, nor are they admitted to any honourable office. All these Druids have one chief, who enjoys the highest authority amongst them. When he dies, he is succeeded by the member of the order who is most prominent amongst the others, if there be any such single individual; if, however, there are several men equally distinguished, the successor is elected by the Druids. Sometimes they even go to war about this supremacy. At a certain time of the year, the Druids assemble on the territory of the Carnutes, which is believed to be the centre of all Gaul, in a sacred place. To that spot are gathered from everywhere all persons that have quarrels, and they abide by their judgments and decrees. It is believed that this institution was invented in Britannia, and thence transplanted into Gaul. Even now-a-days, those who wish to become more intimately acquainted with the institution, generally go to Britannia for instruction's sake.

'The Druids take no part in warfare; nor do they pay taxes like the rest of the people; they are exempt from military service, and from all public burdens. Attracted by such rewards, many come to be instructed by their own choice, while others are sent by their parents. They are reported to learn in the school a great number of verses, so that some remain there twenty years. They think it an unhallowed thing to commit their lore to writing, though in the other public and private affairs of life they frequently make use of the Greek alphabet. . . . Beyond all things, they are desirous to inspire a belief that men's souls do not perish, but transmigrate after death from one individual to another; and they hold that people are thereby most strongly urged to bravery, as the fear of death is thus destroyed. Besides, they hold a great many discourses about the stars and their motion, about the size of the world and of various countries, about the nature of things, about the power and might of the immortal gods; and they instruct the youths in these subjects.'

It is easy to comprehend that this powerful priesthood did all they could to uphold the national cause against the Roman conquerors, and urged the people to rebellion; so much so, that the Emperor Claudius found it necessary to interdict formally the practising of Druidical rites, which seem, however, to have continued down to the extinction of paganism. Besides being priests and teachers of religion (see the article Celts), the Druids appear also to have been adepts in the magic arts and the mysterious powers of animals and plants. The oak-tree was especially sacred among the Druids. In oak-groves, they frequently performed their rites, and they even derived their name from this custom. See the article Celts. They also had a special reverence for the misletoe, when growing on an oak. According to Pliny, a Druid, clothed in white, mounted the tree, and with a knife of gold, cut the misletoe, which was received by another, standing on the ground, in his white robe. The same author gives a curious account of the 'serpent's egg,' worn as a distinguishing badge by the Druids. It was formed, he says, by the poisonous spittle of a great many serpents twined together. Gathered at moonlight, and afterwards worn in the bosom, it was a mighty talisman. All these particulars refer properly to the Druids of Gaul, but Cæsar's testimony leaves no doubt that the Druidism of Britain was essentially the same.

In all the countries anciently inhabited by Celts, there are found rude structures of stone, one of the most common forms of which is the so-called *cromlech* (see that article). The older archæologists assumed that these were Druidical altars, but there is no proof that such was their destination or origin: similar structures are found in Scandinavia and many parts of Germany, and to assume in all these countries the presence of Celts, seems too hazardous. The same doubts prevail as to the larger monuments of this kind—the supposed Druidical temples of Amesbury, of Carnac in Brittany, and of Stonehenge (see that article).

**DRUM**, a Celtic word signifying a round knoll, or a bare round hill, enters into the composition of many names of places, especially in Ireland, as Drumcondra, Drumglass, Drumsheugh.

**DRUM** (Ger. *trommel;* Fr. *tambour*—a modification of *tabour; timbrel* and *tambourine* are other forms of the word *tabour* or *tambour*), a hollow cylinder of wood or metal, having skin (parchment) stretched across one or both ends, upon which the drummer beats with an instrument of wood or metal called a *drumstick.* The drum is used as an instrument of music along with other instruments in bands, and particularly for military purposes. The military drum serves for giving various signals as well as for music. There are three kinds of drum—the *side* drum, the big or *base* drum, and the *kettle* drum. Since 1858, the British infantry are supplied with brass side drums, three pounds lighter than those formerly in use, and tuned with screws instead of straps and ropes. The cavalry drum is a copper or brass hemisphere, thus resembling a *kettle,* with a parchment lid. The big drum has both ends covered with parchment. The ancient Romans used small hand-drums—some resembling tambourines, others kettle-drums—in their religious dances; and the Parthians are said to have used them in war to give signals. They are believed to have been first brought into Western Europe by the Crusaders.

**DRUM**, a name given to a fashionable and crowded evening-party about the middle of the 18th c., at which card-playing appears to have been the chief attraction. The names Drum, Rout, and Hurricane, by which these gay assemblies were known, sufficiently indicate their noisy, promiscuous, and irrational character. Lady Mary Wortley Montagu, writing from Louvère to her daughter in 1753, hints that ladies gave these entertainments to make money at cards to support their extravagance; and adds: 'I find I should be as solitary in London as I am here, it being impossible to live in a *drum,* which, I think, so far from a cure of uneasiness, that it is, in my opinion, adding one more to the heap.' See ROUT and SOIRÉE.

**DRUM**, SACRED, an object of religious veneration and instrument of magical incantation among the Laplanders in former times. It was hollowed out of a piece of the trunk of a pine or birch, in which certain peculiarities were required, and was covered with skin on the upper side only, the wood being partly left on the under side to serve as a handle. Figures were painted in red on the skin; the drumstick was a reindeer's horn; and to the drum were appended a large copper ring and some smaller rings. The drum was considered a necessary part of the furniture of every family. The motions of the rings, when the drum was beaten, which might be done only by the head of the family, were supposed to afford indications concerning the results of disease and other future events. The beating of the drum was accompanied with songs, and the person by whom it was beaten often fell into a trance, during which revelations were supposed to be made to him. The sacred drum seems to have been somehow connected with the worship of the sun.

**DRUM-MA'JOR**, as a component member of a regiment, was not much known in the English army till the time of Charles I. There was in earlier times an officer in the royal household called the *drum-major general,* without whose licence no one except royal troops might use a drum; but this office fell into disuse. The drum-major, when regularly established, received orders from the major of the battalion concerning the necessary beats or signals, and communicated them to the drummers. The management of the big drum, and the teaching and control of the drummers generally, still devolve upon the drum-major. The 'beats' at present adopted by the British infantry were composed by Drum-major Potter of the Coldstream Guards.

**DRUMMER** is a component member of every British regiment. His position is slightly superior to that of the private soldier, but still he is reckoned as one of the rank and file. Besides his ordinary duties (see BEAT OF DRUM), the drummer performs the *drumming out,* when a soldier is discharged with ignominy. See DISCHARGE. To the drummers is also intrusted the repulsive duty of flogging, when that sentence is passed upon soldiers. A *Drum-head Court-martial* (not now much adopted) has no particular connection with the drummers, but is a hasty council or court-martial held in the field around the big drum.

**DRUMMOND**, CAPTAIN THOMAS, R.E., was born at Edinburgh in 1797, and during his professional training at Woolwich and Chatham displayed high mathematical and mechanical abilities, with much aptitude for the application of scientific principles to practical affairs. In 1820, he was engaged by Colonel Colby to assist in the trigonometrical survey of the United Kingdom. The incandescence of lime having been brought under his notice at a lecture on chemistry, the idea occurred to him that it might be advantageously used on the survey to render distant objects visible: he accordingly made experiments, which, with their results, and the first application of the Drummond Light (q. v.) in Ireland, are described by him in the *Philosophical Transactions* for 1826. A heliostat (q. v.) of his invention, described in the same paper, has ever since been employed with success in the survey. Experiments which he made with the view of adapting his '*Light*' to light-houses, are detailed in the *Philosophical Transactions* for 1830. When exhibited at Purfleet, it was powerful enough to cast shadows at Blackwall, distant ten miles. Practical difficulties, not yet overcome, prevented the fulfilment of his hopes in this direction; his attention having been diverted to political life, for which he soon proved himself to be eminently fit. As the head of a commission appointed by Lord Grey's government to superintend the fixing of the boundaries of the boroughs under the provisions of the Reform Bill, he performed most ably that laborious and important work. He next acted as private secretary to Lord Althorp, chancellor of the exchequer; and finally, in 1835, went to Dublin with Lord Mulgrave, as under-secretary for Ireland.

Here the knowledge of Irish character and feelings which he had acquired in the survey was of great advantage to him, and by his impartiality, sound judgment, conciliatory disposition, indefatigable energy, and hearty devotion to the work before him, he at once gained the confidence and affection of the people. It was in a letter written by him to the magistrates of Tipperary on the 22d of May 1838 that the memorable words occurred—'Property has its duties as well as its rights;' an aphorism which instantly flew over Ireland, and continues everywhere to exercise a wholesome influence. But it was perhaps as the head of a commission appointed in 1836 to report on a railway system for Ireland, that D. rendered that country his greatest service by the admirable Report which he had the main labour of producing. So far as the routes recommended have been followed, the expectations of the commissioners have been fulfilled or exceeded; and it is the opinion of good judges, that it would have been well for Ireland had the carefully digested scheme been more fully adopted. By these multiplied labours, however, D.'s strength was overtasked, and he sank on the 15th of April 1840, amidst the grief of the Irish people, and of his intimates in public life, who had hoped to see him rise to some of the highest offices in the state. A statue by Hogan was erected to his memory by public subscription, in the Royal Exchange at Dublin; and a memoir of his professional life (abridged in Knight's *English Cyclopædia of Biography*, ii. 647) was published in 1841 by Captain Larcom, R.E., in the 4th volume of *Papers on Subjects Connected with the Duties of the Corps of Royal Engineers.*

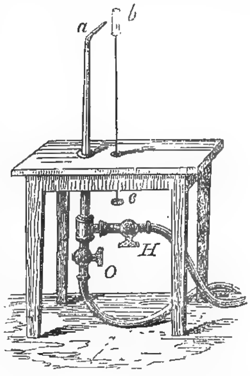
**DRUMMOND**, William, of Hawthornden, a poet of considerable celebrity, was descended from a very ancient and noble Scottish family, and was born 13th December 1585. He was educated at the High School of Edinburgh, and afterwards at the University of that city, where he took his degree of M.A., July 27, 1605. On leaving college, he was sent to the continent in order to study law, for which he exhibited great aptitude. He returned in 1609, and his father dying in the following year, he retired to the paternal estate at Hawthornden, which, according to the learned Ruddiman, 'was a sweet and solitary seat, and very fit and proper for the muses;' and there, with an interval of eight years of foreign travel, spent his life in his favourite literary pursuits. He died 4th December 1649; his death, it is said, being hastened by his excessive grief for the fate of Charles I.

His principal works are the following: *Tears on the Death of Moeliades*—Prince Henry, son of James I.—(Edin. 1613); *Poems: Amorous, Funerall, Divine, Pastorall, in Sonnets, Songs, Sextains, Madrigals* (1616); *Forth Feasting, a Panegyricke to the King's Most Excellent Majesty* (1617); *Flowers of Sion* (1623); *Polemo Middinia* (Oxford, 1691). A new edition of the works of D., with Life by Peter Cunningham, was published in 1833, and another by W. B. Turnbull in 1856. His literary celebrity gained him the close friendship of many men of eminence, among whom may be mentioned Michael Drayton, and the 'rare' Ben Jonson. The latter, in the winter of 1618—1619, travelled down to Hawthornden to visit the poet, and D. is now perhaps best known by his *Notes of Ben Jonson's Conversations with William Drummond of Hawthornden, January* 1619.

D.'s verse abounds in the conceits, antitheses, and hyperboles of the period, and gives indication of a mind indulging itself in melancholy. His sonnets are the best specimens of his muse, although even in them one looks in vain for sustained harmony or great originality of thought.

**DRUMMOND ISLAND**, within the limits of Canada, is in Lake Huron, being the most westerly of the Manitoulin chain. It measures 20 miles by 10, and lies about 30 miles to the east of Mackinaw, an island in the strait of the same name, which pours Lake Michigan into Lake Huron.

**DRU'MMOND LIGHT**, or **LI'ME-BALL LIGHT.** The heat given out during the combustion of a mixture of hydrogen and oxygen gases, or of coal-gas and oxygen, is very intense; and when the mixture is directed on an infusible substance such as lime, a most brilliant light is evolved. Captain Drummond, R.E., originally proposed the employment of this light in the trigonometrical survey of Great Britain, and constructed apparatus for its production. See Drummond, Thomas. The most convenient form of the apparatus is represented in the figure, where the mixed gases escaping by the jet *a*, being set fire to and made to impinge upon the cylinder of lime *b*, raise the surface of the latter nearest the jet to a white heat, accompanied by a dazzling light. As minute portions of lime become detached and are volatilised from the spot on the lime on which the jet of burning gases strikes, it is necessary to expose a new surface of lime to the gases, and for this purpose the screw C may be turned by the hand or by clockwork. The hydrogen and oxygen ought to be confined in separate gas-holders or bags, and to be brought by different tubes, H and O, provided with separate stop-cocks, to within a short distance of the exit jet. The common tube through which the mingled gases pass to the jet is about six inches long by two-thirds of an inch in diameter; and in Mr Hemming's construction the tube is very closely packed, full of very fine brass wire, which is afterwards wedged in by a stout wire being driven down the centre. The object of the fine wires is to prevent the return of the flame, which might lead to a disastrous explosion. When the rays from this light are concentrated by a parabolic reflector, it can be seen at immense distances. Thus, on the 31st December 1845, at half-past 3 P.M. (daylight), the light was exhibited on the top of Slieve Donard, in county Down, and was seen from the top of Snowdon, a distance of 108 miles; and in other instances the D. L. has been seen at distances up to 112 miles. The employment of coal-gas instead of hydrogen has greatly increased the applications of the D. L., and it is now often used in magic-lanterns and other apparatus where great brilliancy and penetration of light are required. By its brilliancy and want of colour, it enables the photographer to work by night as easily as by day. Great caution should at all times be exercised in the preparation, storing, and employment of the gases, as many dangerous explosions have occurred. Little heat is evolved from the D. L., nor does it vitiate the surrounding air, or consume its oxygen.



Drummond Light Apparatus.

**DRU'NKENNESS.** See Intemperance, and also Temperance.

**DRUPE**, in Botany, a succulent fruit containing a single seed or kernel, usually enclosed in a hard 'stone,' the *endocarp*. The succulent part is the *mesocarp*. Examples are familiar in the fruits generally known as stone-fruits, the peach, plum, cherry, &c. In the almond, the mesocarp is not succulent, yet the fruit otherwise possessing all the characters of a D., receives that name. It may be regarded as intermediate between a D. and a nut. The fruits of the genus *Rubus* (Raspberry, Bramble) are composed of many small aggregated drupes, upon a common receptacle. The date is a D. in which the hard 'stone' is represented by a membrane.

**DRURY**, DRU, a goldsmith, silversmith, and cutler, in London, where he was born, 4th February 1725; was devoted to the study of entomology and the collection of exotic insects. His *Illustrations of Exotic Entomology* (2 vols., Lond. 1773—1782), a work unrivalled at the time of its publication for the accuracy and beauty of its figures, is still in high repute as a book of reference. D. was also assiduous in his endeavours to acquire information concerning the habits of insects. He died 15th January 1804.

**DRUSES**, a remarkable people who inhabit a district in the north of Syria, comprising the whole of the southern range of Mount Lebanon and the western slope of Anti-Lebanon. In this district they hold exclusive possession of about 40 towns and villages, and divide the possession of about 200 more with the Maronites (q. v.), while 80 villages in other parts of Anti-Lebanon are peopled by them. The inhabitants of the Lebanon afford a remarkable illustration of the amalgamation of races. After the second captivity of Israel, Esarhaddon re-peopled the wasted strongholds of Samaria with certain fierce tribes, some of whom, called in the Scriptures Cuthites, and known in subsequent times to the Greeks as Carduchi, and familiar to us as Kurds, settled in Lebanon. From them the present D. are supposed to have originally sprung. More than a thousand years later, a fresh colonisation took place. The Mardi, a warlike tribe who dwelt to the north of the Caspian, originally of Persian extraction, were transplanted thither by Constantine IV., in 686 A.D., to the number of 12,000, to act as a bulwark against Mohammedan invasion. The Arabs also, in sweeping through the mountain-fastnesses, left a permanent impression there. Thus, Cuthites, Mardi, and Arabs, or rather Mohammedans of various races, have combined to form that strange being—the modern Druse. It has also been supposed by some that there runs in his veins not a little of the blood of the Crusaders, but this is doubtful. No immigrations, however, of any importance into the country of the Druses took place after the close of the 10th c.; and this period seems naturally to conclude the first great section of Druse history.

The nationality of these mountaineers having now been consolidated, their peculiar and mysterious religion began gradually to be developed. Hakem Biamr Allah, or Bemrillah, calif of Egypt, and a Nero in cruelty, was the author of this system. He affirmed that he was the representative of God, and, having enlisted his confessor, Darazi, in his cause, he prepared to propound his doctrine. In the 407th year of the Hegira (1029 A.D.), the divine nature of Hakem, or rather the incarnation of the Spirit of God in him, was publicly announced at Cairo. This revelation, however, was unfavourably received by the mob. Hakem's confessor, Darazi, narrowly escaped the fate of a martyr to the impostures of his master. Retiring, however, to the fastnesses of the Lebanon, he there began to inculcate the principles of the new faith; and although he never acquired any mastery over the sympathies of the mountaineers, he at least left his name to them; for there can be little doubt that the name Druses is derived from that of Darazi. Hamzé, a Persian mystic, and successively the disciple and vizier of Hakem, introduced into the newly promulgated religion all the elements of attraction and strength which it possesses; and him the D. venerate as the actual founder of their faith.

The D. form one of the very few sects among whom proselytism is discouraged. They are remarkable conservatists. For 800 years they have maintained a distinct religious and political independence and nationality. Into their faith the doctrines of the Pentateuch, the Christian gospel, the Koran, and the Sufi allegories, are wonderfully interwoven. They reject, however, the seven points of Islamism, substituting for them the following seven:—1. Veracity (to each other only); 2. Mutual protection and resistance; 3. Renunciation of all other religions; 4. Profession of the unity of Hakem as God; 5. Contentment with his works; 6. Submission to his will; 7. Separation from those in error, and from demons. They believe in one God in whom there are no parts, to whom they ascribe no attributes, before whom the tongue ceases to utter, the eyes to behold, but who has revealed himself ten times upon the earth under the form and name of mortal men. In Hakem, so Hamzé taught, had God revealed himself for the tenth and last time. They also believe that the number of existing souls never varies, and that all the souls in life now, have lived, vested in some human form, from the beginning of the world, and will so continue to exist till the end of it; that when a man dies, his soul puts on a fresh humanity, which occupies a rank in moral dignity corresponding to the purity or impurity of the past life. But although they believe, in this sense, in the transmigration of souls, they also believe that after the lapse of ages, when the soul will have been purified from every stain, there will come a period of rest. As a religious body, the D. are divided into two classes: the Akals, or those initiated into the Druse mysteries; and the Djahils, the uninitiated. The former do not adorn themselves with gold, or wear silk, embroidered, or fanciful garments; they forbear using wine, spirits, tobacco, and other luxuries, never swear, utter obscene language, or lie. The latter are free from all religious duties. But, however rigid the profession of the Akal or initiated Druse, he is taught that his practice may be conducted in some cases on the principle of expediency. To be truthful, he is taught, is desirable; but when concealment is necessary, then equivocation, or even falsehood, may be practised.

Previous to 1840, Druse and Maronite lived on terms of intimacy and friendship. At that period, however, dissension sprung up between the two tribes, and proved to be the introduction to years of intermittent warfare. The strife reached its climax in 1860. From May to October of that year, accounts of the fearful barbarities practised by the D. upon the Maronites followed each other with appalling frequency, until the indignation of Europe was roused against them; and in August of the same year, an expedition was sent out from France to Syria, with the consent of the Great Powers, for the purpose of protecting the Christian residents and the so-called Maronite Christians, and of restoring tranquillity. But by the official despatches of 1860—1861 from Her Majesty's consuls in Syria, it was clearly proved that, in the words of Lord Dufferin, 'however criminal may have been the excesses into which the Druses were betrayed, the original provocation came from the Maronites, and that they are themselves, in a great measure, responsible for the torrents of blood which have been shed.' Although the lives of women and children were indubitably lost in considerable numbers, yet it was not the D. who were in general guilty of such abominable crimes. It is ascertained beyond all doubt, that with these the Turks, particularly the low fanatical mob of Damascus (who have frequently been confounded with the D., because they fomented their passions), are mainly chargeable; while the retaliation of the Maronites, who took refuge in the French camp, was equally vindictive and horrible. The number of lives lost in the Syrian massacres was never definitely ascertained, but must have amounted to many thousands. It may be added, as illustrative of the blood-thirstiness of the Maronite leaders (who in most cases were bishops), that on being asked to furnish sworn lists of such of the D. as, from the unusual atrocity of their crimes, were worthy of death, they sent in a list demanding 4946 heads; refusing, however, to bring forward any particular charges against them.

The D. were, until lately, governed by a Grand Emir subject to the Porte; but at the conclusion of the late troubles, it was resolved that one ruler, and he a Christian—the Maronites are, in proportion to the D., as three to one—should be appointed as their governor. Accordingly, after some deliberation at the Porte, Daoud Effendi, formerly Director-general of Telegraphs, was appointed to the Lebanon to act as governor, with full powers, June 22, 1861.

The D. are about 80,000 in number; they are a brave, handsome, and industrious people, and are almost all taught to read and write. Polygamy is unknown among them. They have, with incredible toil, carried the soil of the valleys up and along the hillsides, which are laid out in terraces, planted with mulberry, olive, and vine. From the produce of these, the hardy mountaineers draw the greater part of their sustenance. Their chief trade is the manufacture of silk. Corn is also raised, though in very small quantity. Deir-el-Kammer is the principal town. See *Druses of the Lebanon*, by the Earl of Caernarvon (Lond. 1860).

**DRUSUS**, the name of a distinguished family of the gens Livia, which contributed a large proportion of eminent men to the Roman commonwealth. The most conspicuous of the Drusi were: 1. M. LIVIUS DRUSUS, tribune of the people in 122 B.C., who made it the business of his public life to thwart the democratic policy of his colleague, C. Gracchus, and uphold the cause of the senate and nobles, which he did with much skill and ultimate success. 2. His son, who bore the same name as himself, and whose dangerous and daring political intrigues, conducted partly for the benefit of the aristocratic party whose sympathies he inherited, and not less for his own aggrandisement, kept Rome in perpetual turmoil and disorder from 100 B.C. till his death in 91 B.C. Though identified by birth and sympathy with the patricians, Drusus, to win the people, renewed some of the most liberal measures of the Gracchi, and carried agrarian and frumentarian laws. During the latter years of his life, he contrived to gather into his own hands the threads of the various political movements which resulted in the Social War; but his almost incredible pride and arrogance had made him so many enemies, that his death, in the flower of his age, was regretted as little by his friends as by his foes. 3. The most illustrious of the Drusi was Nero Claudius Drusus, commonly called Drusus Senior, the stepson of the Emperor Augustus, and younger brother of the Emperor Tiberius. He was born in 38 B.C., and as he grew up, developed splendid personal qualities as well as the highest capacity for civil and military affairs. He began his public career in 19 B.C., and signalised himself when only 23 years old by his defeat of the Rhæti and other Alpine tribes which infested the north of Italy. In 13 B.C., he was sent into Gaul, then in revolt, and, after crushing the rebels there, pushed across the Rhine in pursuit of their German allies. In this campaign he subdued the Sicambri and Frisii, and forced his way to the German Ocean, being the first Roman general who had done so. From this time he made the business of his life to establish the Roman supremacy in Germany, partly by conquest, and partly by the execution of great military works. Among these latter may be mentioned the canal joining the Rhine with the Yssel, the two bridges over the Rhine itself, and the embankments of the Vahalis, the Waal. In 11 B.C., he conquered the Usipetes, the Cherusci, and the Suevi; in the following year, the Chatti, the Nervii, and was prosecuting the work of subjugation in 9 B.C., when a fall from his horse cut short his brilliant career in his 30th year. For his exploits in Germany, Drusus was rewarded with the title of Germanicus, but care must be taken not to confound him with the celebrated Germanicus, his own son. See GERMANICUS.

**DRY PROCESS**, in Photography. By a reference to the article COLLODION PROCESS, it will be seen that the collodionised glass-plate, on being withdrawn from the bath, previous to, and during exposure in the camera, has mechanically adhering to its surface a quantity of solution of free nitrate of silver, and it is partly upon the presence of this salt that the extreme sensitiveness of wet collodion plates depends. This, however, is not the sole cause of sensibility to actinic rays; carefully conducted experiments fairly lead to the assumption, that the molecular arrangement of the ultimate particles of iodide of silver, and of the pyroxyline, forming, as it were, the network of the film while wet, materially affect this necessary condition; and it is the object of what is termed a *dry process* to preserve this molecular arrangement as far as possible unaltered, notwithstanding the disturbing influence which would necessarily be exerted by the desiccation of the film. This desirable end for travelling photographers is accomplished with more or less certainty by the employment of solutions of various substances, which are poured over the film after the adhering nitrate of silver has been removed by copious washing with water. The heterogeneous character of the substances so used goes far to prove that their action is principally *mechanical*, they being selected from the animal, vegetable, and mineral kingdoms. Among the first may be mentioned honey, gelatine, glycerine, milk, and albumen; among the second, syrups, gum, wine, beer, balsams, and resins added to the collodion, and linseed tea; and among the third, chloride of calcium, nitrate of zinc, and nitrate of magnesia. The plate, on its removal from the sensitising bath, being well washed with water, any one of these substances is dissolved in water in suitable proportion, and applied to the surface of the plate by pouring on and off several times. It is then set up to drain and dry on folds of bibulous paper in a dark closet or box. The plate is then ready for use. The pictures obtained on plates so prepared do not suffer by comparison with those taken by the wet collodion process; the only drawback to their use being a slight diminution in the degree of sensibility to light.

**DRY ROT**, a kind of decay, often very rapid, to which timber is subject, without the presence of much moisture. It has proved ruinous to many valuable edifices, and has been the cause of many serious accidents. The ends of joists are often affected by it, so that upon being burdened with even a slight additional load, they are ready to break off by the wall; and the process of destruction has often gone far without a suspicion being entertained of anything wrong. Dry rot is occasioned by *Fungi*, the *mycelium* of which diffuses itself through the substance of the timber, destroying its texture, and reducing it to a fragile or even friable mass. *Merulius lacrymans*, *M. vastator*, and *Polyporus destructor* (see AMADOU), are species very commonly productive of this mischief; the first being the most common and formidable dry-rot fungus in Britain, and the last having the same pre-eminence in Germany. Its German name is *Hausschwamm*. Other fungi, however, produce the same effects where none of these are present; but besides the species which are well ascertained, there are some forms of mycelium not unfrequently occurring as dry rot, of which it is uncertain to what fungus they ought to be referred, as they have not been observed to develop themselves in any perfect form, whilst also it is not known what different modifications of appearance the mycelium of the same fungus may exhibit in different circumstances. Very destructive ravages have been ascribed to different species of *Sporotrichum*, particularly in the naval yards of Britain; but the genus is altogether a doubtful one, and not improbably consists of mere forms of undeveloped mycelium. Several species of fungi are often present together in timber affected with dry rot. Some of them penetrate deeply into the substance of the timber, others spread more superficially, but attract moisture from the atmosphere, which hastens decay. This is the case with *Merulius lacrymans*, which first appears in small white points; a filamentous substance radiating from these gradually forms broad patches, sometimes many feet in diameter; from these long creeping shoots often proceed, and a net-work of filaments penetrates into every crevice. The species of *Polyporus* more generally fill the whole mass of the timber with delicate filaments, which destroy the cohesion of its fibres. *Dædalea quercina* appears in the form of leathery laminæ, often in the strongest oak, and the delicate threads of mycelium penetrate every duct and cavity, reducing the whole to a fungous mass. Beautiful orange tufts sometimes appear, supposed to be the mycelium of species of *Coprinus*.

Of the causes of dry rot, stagnation of air, as behind a wainscot or under a floor, is certainly one of the chief, and a knowledge of it suggests means of prevention which may often be easily and most advantageously employed. Another principal cause is insufficient drying of the timber itself; and much of the prevalence of dry rot is not improbably due to the practice of felling oak in spring for the sake of the bark, when the wood is full of sap. Any circumstance which may tend to render the sap acidulous, greatly increases the liability to dry rot. The production of fungi takes place with unusual rapidity when by fermentation or otherwise an acidulous condition of organic substances is produced. A fermentation and chemical change in the albuminous constituents of the wood, is not improbably the immediate cause of dry rot, providing a soil suitable for the vegetation of fungi.

For the prevention of dry rot, various processes have recently begun to be employed, the object of which is to fill the pores of the wood with some chemical substance. Sir William Burnett used chloride of zinc; Mr Bethell used creasote; and Mr Payne, lime, with silicate of potash. The process most generally approved, and apparently most successful, is that of Kyan, called *Kyanising* (q. v.), in which a solution of corrosive sublimate is introduced into the pores and cells of the timber by means of an air-pump. The salts of mercury have been found to be more unfavourable to the development of fungi than any other chemical substances.—But without the use of any such means, we have abundant evidence that well-seasoned timber, in favourable circumstances, may remain unassailed by fungi for many centuries. England contains structures of which the timber is known to be nearly 1000 years old; wood in a state of perfect preservation was brought by Lord Elgin from behind the frieze of the Parthenon, where it must have been placed more than 2000 years ago; and the British Museum contains a block of charred wood found by Mr Layard in his excavations at Nineveh.

**DRY STOVE**, in Gardening, a hothouse in which the air is kept less moist than in the bark stove. In structure and in management, except that the temperature is kept higher, it agrees more nearly with the green-house. The dry stove is particularly adapted to succulent plants. As free an admission of air is allowed in the dry stove as is consistent with the maintenance of the temperature.

**DRY'ADS**, an inferior order of deities in the mythology of Greece. Their name is derived from the Greek word for an oak-tree (*drus*). They were looked upon as the guardians of the larger kinds of forest trees, along with which they came into being, and with which they died.

**DRY'DEN**, JOHN, was born at Aldwinckle, in Northamptonshire, on the 9th August 1631. His father, Erasmus Driden, was the third son of Sir Erasmus Driden, created a baronet in 1619. D. received the rudiments of his education at Tichmarsh, and was afterwards admitted a king's scholar at Westminster School, under Dr Busby. Here, in 1649, he wrote an *Elegy on the Death of Lord Hastings*, and some commendatory verses on the *Divine Epigrams* of his friend John Hoddesdon; both of which performances were published in 1650. In May 1650, he was elected to a scholarship in Trinity College, Cambridge; he took the degree of Bachelor of Arts in 1653—1654; and was made Master of Arts in 1657. His father dying in 1654, put him in possession of an estate worth £60 per annum, of which sum his mother had life-interest in a third. After leaving the university, he proceeded to London, under the patronage of Sir Gilbert Pickering, who was faithful to the Protector, and seems to have aroused for the time the same feeling in his protégé, whose first poem of importance was entitled *Heroic Stanzas on the Death of Cromwell.* On the return of Charles II., D., with equal splendour of diction, and perhaps with equal sincerity, congratulated the Restoration.

The publication of a poem, entitled *Astræa Redux*, led to a breach between the poet and the family of Sir Gilbert Pickering, and he now became author by profession. He turned his attention to the stage, planned *The Duke of Guise*, and wrote his first acted play, *The Wild Gallant.* In December 1663, he married a daughter of the first Earl of Berkshire, with whom he received a portion; and in 1670 he was appointed poet laureate and historiographer, with a salary of £200 a year. He afterwards entered into an engagement with the theatres to supply them with three plays each year, for which he was to receive annually from £300 to £400; but as he did not fulfil his share of the contract, it is not probable that the theatres fulfilled theirs. In 1671, the Duke of Buckingham produced his attack on the English heroic drama, of which D. was the head. This satirical piece was entitled *The Rehearsal*, and when it was brought on the stage, the town was amused. Although personally satirised, D. endured his castigation in silence, and, waiting his opportunity, immortally revenged himself on the witty and profligate duke in the *Absalom and Achitophel.* This magnificent satire arose out of the political commotions of the times, and is an elaborate defence of the king against the Whig party. Charles II. is *David;* Monmouth, *Absalom;* Cromwell, *Saul;* Buckingham, *Zimri;* and Shaftesbury, *Achitophel.* Its success was amazing; it ran through five editions within the year. This great poem appeared in 1681; and enraged at its success, D.'s enemies hovered around him like a cloud of venomous gnats. In the same year he published *The Medal.* Elkanah Settle, one of the most virulent of his foes, replied with some effect; and D., thoroughly roused, issued next year the *Mac Flecknoe*, and the second part of *Absalom and Achitophel.* These satires were as overwhelming as the Italian battles of the first Napoleon; D.'s enemies were crushed for ever, and he remained during his lifetime the undisputed king and lawgiver of English literature.

After the death of Charles II., D. became a convert to the Roman Catholic faith. This event was announced to the world by the publication of *The Hind and Panther*, in 1687. For this change of faith, he has been much abused. Macaulay calls him 'an illustrious renegade.' Mr Bell, his latest biographer, strenuously defends his conscientiousness. At the Revolution, he was deprived of his laureateship, and somewhat straitened in circumstances, he fell back upon his old occupation of writing for the stage. His translation of *Virgil* was begun in 1694, and completed by the close of 1696. A month after the publication of *Virgil*, appeared the *Ode on Alexander's Feast.* In 1698, he commenced his *Fables*, and completed them in a year and a half. His last work was a masque, with prologue and epilogue. He died on the 1st May 1700, and was buried in Westminster Abbey, where a monument was erected to his memory by John, Duke of Buckingham.

Although the great bulk of D.'s works are composed of plays, and although these are, for the most part, devoid of character, feeble in sentiment, false to all external nature, and exaggerated in expression, he remains one of the prime glories of English literature. His *Satires* and his *Fables* are masterpieces. In these, he is almost always masculine and natural, and his versification flows on broad, deep, and majestic. Nor is he famous only as a writer in verse; in his prefaces, and his *Essay on Dramatic Poesy*, he proves himself to be a master of what he so finely calls 'that other harmony of prose.'

**DRYING-MACHINES.** The ordinary process of drying clothes and fabrics by exposure in the open air, has been found too tedious for the bleacher, dyer, and for large laundry establishments; and hot-air chambers have been extensively used; but a great improvement has been lately made by using the principle of centrifugal force to throw off the greater part of the moisture. The drying-machine commonly used consists of two drums or cylinders open at the top, the inner one, into which the goods are packed, is perforated at its sides, and made to revolve with great velocity either by steam, water, or hand-power. The action of the drying-machine is precisely the same in principle as that witnessed when the housemaid is *trundling* a mop, or of the dog when he shakes himself on coming out of the water. The use of the outer cylinder is merely to catch the drops of water thrown out, and prevent the inconvenience that would result from its distribution through the apartment. A pipe connected with this outer drum carries the water away. The drying is not, however, quite completed by such machines; a very slight degree of moisture, just perceptible to the touch if the goods are pressed against the cheek, still remains. This is expelled by open-air or hot-chamber drying. These drying-machines are commonly called 'extractors' by dyers. A simpler and cheaper drying-machine has been lately introduced for domestic use. It consists of two wooden rollers mounted parallel, and one above the other, with an adjustment to vary the distances between them. One end of the article to be dried is inserted between the rollers, which are then brought as close as possible together, and one roller is turned by a handle, the other, being free to revolve, turns also as the clothes pass between them—the moisture in this case being extracted by pressure, as in the common process of 'wringing.'

**DRYING OILS.** See Oils.

**DRY'NESS**, a technical term in painting, used to indicate a style in which the drawing is hard, angular, and formal, and the colour deficient in harmony and mellowness, though not necessarily in power or richness. The earlier works, both of the Italian and Flemish schools, all more or less partake of this defect; and it is the most prominent characteristic of those of their imitators to whom the name of pre-Raphaelites has been given.

**DRYOBA'LANOPS.** See Camphor.

**DRY'OPHIS**, a genus of serpents of the family *Colubridæ*, allied to *Dendrophis*, and, like those of that genus, of very elongated form, and living mostly among the branches of trees, but distinguished by a projecting muzzle—a curious prolongation of the upper jaw, which in some is slender, in some leaf-like. They are natives of the East Indies, Madagascar, and tropical America.

**DRY'-POINT**, a sharp etching-needle, used to incise fine lines in copper, without the plate being covered with etching-ground, or the lines bit in by acid. See Engraving. The work produced by the dry-point is not only very delicate, but it wears less in printing than lines produced by the action of acid. Fairholt's *Dictionary of Art Terms.*

**DU'AL**, in Grammar, is the form given in some languages to a noun or a verb, when only two things are spoken of. Thus, in Greek, *pater* is father; *patere*, two fathers; *pateres*, fathers. To have a dual number in addition to a plural, is often spoken of as a refinement of language. It argues, however, a higher degree of abstraction to be able to conceive every subject as one, or more than one, than to require three classes—one, a pair, and more. Accordingly, it is only in some of the more ancient languages that we find traces of a dual number, and it becomes lost as the power grows of analysing concrete impressions. Sanscrit, ancient Greek, Arabic, and Hebrew have the dual number, the last only in nouns. Modern Greek has lost the dual. The only trace of it in Latin is in the two words *duo*, two, and *ambo*, both. It is wanting in the Germanic languages, with the exception of the ancient Gothic, which had a dual form of the verb. In Anglo-Saxon, there was a separate form of pronoun for 'we two' (*wit*) and 'ye two' (*git*).

**DU'ALISM** is the name given to a philosophical theory, according to which some two principles, of different nature, original, and incapable of being derived the one from the other, lie at the bottom of everything; as, for example, the ideal and the real, or the material and the thinking substance. In a narrower and theological sense, dualism means the assumption of two original beings, a good and an evil, as in the doctrine of Zoroaster, or of two distinct principles in man, a bodily and a spiritual. The opposite of dualism is Monism (q. v.).

**DU BARRY**, Marie Jeanne Gomard de Vaubernier, Comtesse, favourite of Louis XV., was born August 19, 1746, at Vaucouleurs. Her mother was a dressmaker, and her father, or rather her reputed father, was an exciseman named Vaubernier. After the death of her father, she stayed for some time at a convent, but left it when fifteen years of age; went to Paris, and assuming the name of Mademoiselle Lange, succeeded in obtaining employment in the establishment of a fashionable milliner; but in a short time renounced all honest occupation, and forming a connection with a disreputable house, met there the Comte Jean Du Barry, one of the most noted *roués* of his day, who made her his mistress. This person afterwards introduced her to Lebel, valet-de-chambre of Louis XV., who presented her to his royal master, then nearly 60 years of age. She was at this time remarkably handsome, to some extent witty, and had a frankness, or it might be, a vulgarity of manner that amused the doting monarch. Desirous that *la petite Lange* should obtain a title, and be introduced to court, Louis prevailed upon Comte Guillaume Du Barry, brother of the comte already mentioned, to marry, and thereby confer his title upon, the favourite. Accordingly, in 1769, she was presented to court as the Comtesse Du Barry. After this period, many of the most powerful courtiers abased themselves before her. D'Aiguillon became her confidant, and in concert with her, ruled the doting king; the Chancellor Maupeou claimed a remote relationship with her, and by her influence succeeded in dismissing and exiling the parliament in 1771; the Abbé Terray, comptroller-general of finance, was *suave* to her, though insolent to all the rest of France. At no period, perhaps, was the court of France more openly and outrageously immoral than during the supremacy of this strumpet.

On the death of Louis, however, in 1774, Du B. was dismissed from court, and sent to live in a convent near Meaux. She was afterwards removed to her residence of Luciennes, and while living there was allowed a pension by Louis XVI. Some time after the outbreak of the Revolution, she went to London to dispose of her jewels. On her return, Robespierre caused her to be arrested, July 1793. In November, she was tried before the Revolutionary Tribunal, and accused of 'having wasted the treasures of the state, of conspiracy against the republic, and of having, in London, worn mourning for the late king.' She was condemned to death, and was sent to the guillotine 7th December 1793. Of all the women who mounted the scaffold during the Revolution, Du B. exhibited the least courage. She implored the 'good people' to deliver her, and Monsieur the executioner to prolong her miserable life for one moment only. The single good thing that history records of her, is her patronage of various artists and men of letters, but there is little reason to believe that it originated in anything higher than her dread of epigram and caricature. She had neither taste nor knowledge, and cared only for sensual gratifications and excitement. It is estimated that she cost France 35,000,000 francs. The *Mémoires* published under her name (6 vols., Par. 1829—1830) are not reliable. The only work, it seems, which can be consulted with confidence is Lacretelle's *Histoire de France pendant le* 18$^{me}$ *Siècle*.

**DUBI'TZA**, a fortified town of European Turkey, is situated on the northern frontier of Bosnia, on the right bank of the Unna, and at a point about ten miles from its confluence with the Save, of which it is a tributary. During the 16th and 17th centuries, it was a bone of contention between Austria and the Porte, and was repeatedly lost and regained by the latter. It is chiefly notable, however, for its heroic but unavailing resistance to the Austrians in 1788. D. was subsequently restored to the Turks, to whom it now belongs. Pop. 6000.—Over against Turkish D., on the opposite bank of the Unna, stands Austrian Dubitza, a strongly fortified market town in Austrian Croatia.

**DU'BLIN**, a maritime county in the east of Leinster Province, Ireland, and containing the metropolis of that country; bounded, N., by Meath; E., by the Irish Sea; S., by Wicklow; and W., by Kildare and Meath. It is the smallest but two of the Irish counties, being 32 miles long, and 18 (average 12) broad; area, 354 square miles, of which $\frac{6}{7}$ths are arable, and $\frac{1}{40}$th in wood. The coast, from its indentations with creeks and bays, is 70 miles long, and off it lie several isles. Dublin Bay, one of the finest in the kingdom, is 6 miles broad, 6 deep, with a sweep of 16 miles. It has two precipitous hills, about 500 feet high at its north and south ends; but the head of the bay is low and sandy. The coast is defended by 26 martello towers. The surface is mostly a level rich plain, with slight undulations, but rising in the south in a hill-range, the highest point of which is Kippure, 2473 feet. North of this range, the only prominent eminences are Lambay Isle, or Ireland's Eye, and Howth Head, 503 feet. The only river of note is the Liffey, which runs through Dublin city into Dublin Bay. The Royal and Grand Canals run west through the county, and unite the Liffey and the Shannon. The chief rocks are carboniferous limestone, granite, and some metamorphic rocks and greenstone. There are copper and lead mines near Scalp. Fullers-earth and potters-clay occur. Iron and manganese are found on Howth peninsula. Granite and limestone are much used in building. There are many mineral springs, including ten saline purgative ones, within the city of Dublin, and some tepid ones of 75° F. The climate is mild. The soil is generally a shallow calcareous gravelly clay. In the north and west are grazing and meadow farms, and around Dublin city, villas, kitchen-gardens, dairies, and nurseries. D. is the best cultivated county in Ireland. In 1858, half the county was in crop. The chief crops are oats, wheat, and potatoes. There are important fisheries along the coast of turbot, brill, sole, plaice, cod, ling, haddock, whiting, and oysters. The manufactures (chiefly of cottons, stockings, and embroidered muslins) are mostly confined to the city and the vicinity of the metropolis, and are of more value than in any other Irish county. Balbriggan is famed for its hosiery. The chief exports are from Dublin city. D. is divided into 9 baronies, 4 poor-law unions, and 83 parishes. The chief towns are Dublin, the capital of Ireland, and Kingston. Pop., exclusive of Dublin city, 1841, 140,047; 1851, 146,731. D. is the only Irish county whose population increased between 1831 and 1841, and from 1841 to 1851. In 1851, D. had 148 national schools, with 27,272 scholars. The county sends six members to parliament—two for D. county, two for Dublin city, and two for Dublin University. The manners, appearance, dress, and cabins of the lower orders of D. county differ less from those of the interior of Ireland than would be expected from the vicinity to the metropolis. There are numerous antiquities in different parts of the county.

**DUBLIN** (Irish, *Dubh-linn*, 'black pool;' the *Eblana* of Ptolemy), the capital of Ireland, stands on the river Liffey, where it disembogues into Dublin Bay, in lat. 53° 20′ 38″ N., and long. 6° 17′ 30″ W. It covers an area of 1300 acres, but its parliamentary boundary comprises an area of about 5000 acres, and its municipal boundary nearly 4000 acres. Much of D. is built on land reclaimed from the sea;

and the ground is generally flat, with a very few undulations, scarce deserving the name of hill. The river, running from west to east, divides the city into two almost equal portions. The aristocratic parts are the south-east and north-east, containing many beautiful squares, with splendid streets and terraces. The centre, and the north-west quarter are the great emporiums of trade, and the residence of the middle classes, many of whom, however, have their private houses in the suburbs. The south-west division, part of which is called the 'Liberties,' once the seat of the silk trade, is the most filthy and degraded portion of the city. The streets in this quarter, which is the oldest part of the town, are narrow, crooked, and irregular, while in the fashionable portions they possess a totally opposite character. The city is surrounded by a 'Circular Road' of nearly nine miles in length, which forms a favourite walk and drive for the inhabitants. The diameter of this road is about 2¼ miles.

In the newer parts of D., the streets run at right angles to one another, and are remarkable for their breadth and the uniformity of their architecture, which, however, is so varied as to avoid monotony. The most imposing one is Sackville Street, which is perpendicular to the river. It is 120 feet broad, and nearly 700 yards long; at its north end stands the Rotunda, with Rutland Square—in its centre, the beautiful Ionic portico of the General Post-office, and Nelson's Monument (upwards of 130 feet high)—while on the south, it is terminated by Carlisle Bridge, and a wedge-like block of noble houses formed by the converging sides of Westmoreland and D'Olier Streets. A peculiar feature of D. is its squares, which are very numerous, spacious, and well kept. Stephen's Green, the largest, occupies an area of nearly 20 acres, and is about a mile in circuit. Somewhat smaller, but more elegant and aristocratic, is Merrion Square (13 acres). The large park and squares of Trinity College occupy more than 40 acres.

The public buildings of D. are famed for their number and grandeur, and appear to more advantage since the dwelling-houses are built of brick. In the first class may be mentioned the Bank of Ireland (formerly the House of Parliament), Trinity College, the Custom-house, and the Four Courts, which, from the chasteness of their design, and the massiveness of their proportions, have a very imposing effect. The castle has no pretensions to architectural beauty. There are monuments to William III., in College Green (once a *green*, but now a paved street); of Nelson, in Sackville Street; of the late Duke of Wellington, in the Phœnix Park, with several others. The benevolent and charitable institutions of D. are very numerous, and are liberally supported.

Within the limits of the Circular Road, the Liffey is crossed by nine bridges (two of iron), and throughout the whole extent of the city the banks of the river are faced with granite walls and parapets. On each side of these 'quays' there is a spacious roadway, with tall houses and excellent shops, the whole forming a remarkable contrast to the untidy and filthy margins of the Thames. The quay proper extends eastward from Carlisle Bridge. Near the Custom-house, there are several large docks for the accommodation of vessels from distant ports with excisable cargoes. These docks are also in communication with the Royal and Grand Canals, the former connecting Dublin with the northern course of the Shannon and the west of Ireland, the latter with the southern portion of the same river and the south. The harbour has been much improved in late years by the completion of two large breakwaters, the north and south walls, which have both deepened the water, and rendered the harbour more safe. There is a bar at the mouth of the harbour, but even there, the least depth at low tide is about 11 feet.

The chief manufacture of D. is poplin, which is much celebrated. This, with some glass-works, foundries, distilleries, breweries, and those workshops which are necessary to supply domestic wants, are the main branches of industry. In this regard, D. is much more of a capital, and less of a manufacturing and export city than London. People flock to D. to spend money, not to make it; and the trade of the city and port is therefore very much regulated by the wants of this gay population. The direct foreign trade, though increasing, is very limited, Glasgow, Liverpool, and Bristol intercepting the greater portion of it. Much of the inland traffic is carried on by the canals above mentioned, and by the railways (now extending to all parts of Ireland), and consists principally of articles of dairy and farm produce from the central counties. The principal banks are the Bank of Ireland, the Royal, the National, Provincial, and Hibernian, with some private establishments.

The great educational institution of D. is Trinity College and University. See DUBLIN, UNIVERSITY OF. In regard to schools, D. is not well supplied. There is no public school such as the High School of Edinburgh, but the education of the upper and middle classes is left entirely to private enterprise. For the humbler classes, much has been done by the National Board (whose model schools are attended by large numbers of children), by the Church Education Society, and other agencies. There are many literary and scientific societies, dealing with subjects of general knowledge, or with matters of local or national interest. There are two botanic gardens—one at Glasnevin, belonging to the Royal Dublin Society, and one near Donnybrook, connected with the university.

The municipal affairs are under the control of a town-council, which consists of a lord mayor, 15 aldermen, and 45 councillors. The revenue which they derive from property and other sources varies from £30,000 to £40,000. There is a large police force, which has charge of the city and of all the surrounding country as far as eight miles from the castle. The city sends two members to parliament. The population of city and suburbs, in 1861, was 295,964.

The environs of D. are especially beautiful. Rathmines, a southern suburb, has become a large township, and is the favourite residence of the wealthier part of the mercantile community. Glasnevin, on the north, deserves special notice as the favourite residence of the poet Tickell, of Addison, Steele, Parnell, Swift, Sheridan, and many other celebrated men. In the cemetery at Glasnevin lie the remains of Curran, O'Connell, and Tom Steele. The Phœnix Park is a magnificent area of nearly 2000 acres, in some parts level, in others with broken ground, having a large amount of timber and brushwood, which shelter immense herds of deer. It affords ample scope for military reviews, and is most extensively used by the inhabitants of D. of all classes for recreation. D., as a whole, with its magnificent bay—which has often been compared to the Bay of Naples—splendid park, massive public buildings, wide streets, spacious and well-kept squares, clean and elegant quays, and beautiful environs, is one of the most handsome and delightful capitals of Europe. The residence of the Lord-lieutenant brings to the city many of the Irish aristocracy and country gentry, and thus keeps alive a vestige of the trade which was so brisk before the Union.

There are 66 Protestant places of worship, 9 Roman Catholic, with 3 monasteries, 8 convents, 5 friaries, a Jesuits' church, and a Jewish synagogue. The Archbishop of Dublin and 'Primate of Ireland' has a revenue of £7786 a year.

The number of vessels entered inwards in the port of Dublin was, in 1859, 7242, with a tonnage of 965,185; cleared outwards, 4560, with a tonnage of 719,193. The customs revenue in 1859 was £1,053,511, and the excise, £780,059.

**DUBLIN**, UNIVERSITY OF. The first university of Dublin was established in connection with St Patrick's Cathedral in 1320; but for want of proper endowments, it never prospered, and dragged out a miserable existence till, probably, the dissolution of the cathedral by Henry VIII.

*Foundation.*—The existing university was founded in 1591—1592, and stands in the position of being a college with university powers. Trinity College, indeed, was intended merely as the *nucleus* of a university, but as no colleges have since been added, it remains in undisputed possession of all university privileges. Queen Elizabeth provided the charter, the corporation of Dublin bestowed the ground and ruins of the suppressed monastery of All-Hallows, and the Irish gentry supplied by subscription the funds necessary for the erection of the buildings. The income of the college was very limited and very precarious, till James I. endowed it with certain estates in the province of Ulster, and a yearly pension of £388, 15*s.*, English money, from the public purse.

*Constitution.*—By Queen Elizabeth's charter, the corporation was to consist of a provost, three fellows, and three scholars, in the name of more, with the power of purchasing, taking, and possessing any manors, tenements, &c., from the sovereign, or from any other person. On a vacancy in the provostship, the fellows were entitled to elect a fit successor, and the election of fellows and scholars lay with the provost and fellows. The provost and fellows had full powers to enact statutes, confer degrees, and prescribe the necessary exercises for graduation, and to do all the work of tuition. Defects soon began to shew themselves in this constitution, but they were remedied by the new statutes of Archbishop Laud, which were definitively published in 1637, and which are in the main still in force. By these the election of provost was given to the crown.

*Parliamentary Representation.*—In 1613, James I. conferred on the university the right of sending two members to the Irish parliament. One of these was taken away at the Union in 1800, but was again restored by the Reform Bill of 1832. The electors were formerly the provost, fellows, and scholars; but, in 1832, the privilege was extended to masters of arts, and those of higher degree.

*Board.*—The provost and senior fellows form the board of management of the college. They meet every Saturday, and transact all the financial and other business.

*Officers.*—The government and working of the university are intrusted to the following officers: the chancellor, vice-chancellor, provost, two proctors (one chosen from the senior, and one from the junior fellows), a senior lecturer (who regulates the public examinations), two deans, and a censor, librarian, registrars, an auditor, university preachers, professors, and examiners.

*Senate.*—The chancellor (or, in his absence, the vice-chancellor or *pro* vice-chancellor), all masters of arts, and doctors of the three faculties, whose names are on the college books, form the senate of the university. The senate elects the chancellor, and confers degrees.

*Caput.*—The caput of the senate consists of the chancellor, vice-chancellor, provost (or vice-provost), and senior master *non-regent*, who is chosen by the senate. Every *grace* (for the bestowal of a degree) must first receive the sanction of the provost and senior fellows, be afterwards approved of by the caput (each member of which has a *negative* vote), and finally be confirmed by the senate in public congregation.

*Provost.*—The provost, who is appointed by the crown, must be a clergyman not under thirty years of age, and at least a bachelor in divinity. He enjoys an income of about £3000 a year.

*Fellows (Senior).*—The fellows are all chosen, in the first instance, by examination; but the seniors are promoted from the juniors, in order of seniority. They have no stated duties, except those connected with the general management of the college affairs. Some of them, however, hold professorships and other offices, such as senior lecturer, senior proctor, bursar, &c. The income of a senior fellow ranges from £1200 to £2000 a year.

*Fellows (Junior).*—The junior fellows are elected by examination. They form the great teaching staff of the college, and do all the duties of lecturing and examining the undergraduates. Most of them are tutors, and their income, which may average £600 a year, is derived partly from a salary given by the college, and partly from their duties as tutors, lecturers, and examiners. All the fellows must be members of the English Church, and all must be in priests' orders, except five—a *medicus*, two *juristæ juris civilis*, and two *juristæ juris Anglici.* The number of the junior fellows has been altered from time to time, but by a queen's letter recently issued, it is now fixed at twenty-three—the present number of twenty-seven being gradually reducible. The law of celibacy, imposed in the reign of Charles I., was repealed in 1840.

*Professors.*—There is a very complete staff of professors, who represent almost all subjects of human knowledge. Besides a full complement of lecturers in divinity, natural philosophy, mathematics, law, and medicine, there are professors of ancient, oriental, and modern languages (Irish, Arabic, and Sanscrit being among the number), moral philosophy, oratory and English literature, modern history, political economy, natural history, botany, geology, mineralogy, civil engineering, and many others.

*Scholars.*—Of the scholars, who are elected from among the undergraduates, there are two classes—foundation and non-foundation. The former (70 in number) must be members of the Episcopal Church, the latter not necessarily so. The former are members of the corporation, and have the university franchise; but the latter are deprived of both these privileges. Scholarships (which are tenable for five years) are gained by public competition—some being assigned for classics, and others for science—the provost and senior fellows, assisted by some of the junior fellows, if desired, are the examiners. The various emoluments of a scholar, arising from salary, remission of fees, rooms, commons, &c., amount to about £50 per annum. Besides these, there are minor scholarships for the encouragement of the study of divinity and the Irish language; while others are connected with the royal and endowed schools.

*Students.*—There are four grades of students. 1. Noblemen, sons of noblemen, and baronets, who have certain special privileges; the first two being allowed the degree of B.A. *per specialem gratiam.* 2. Fellow-commoners, who obtain degree with one examination less than pensioners, and who dine at the fellows' table. 3. Pensioners, who form the great body of the students. 4. Sizars, who have rooms and commons free. The sizars are limited to 30;

they are elected by competitive examination, and hold their sizarships (worth about £37 per annum) for four years. Each rank has a dress peculiar to itself.

*Entrance.*—Students are admitted to the college after an examination over a prescribed course of classics, arithmetic and algebra, English history and composition, and modern geography. The honour of *first place* at entrance examination is keenly contested; and there are, besides, prizes of £5 and £2 for excellence in special branches of the entrance course, and also for Hebrew.

*Tutors.*—Each student must at entrance place himself under one of the 18 junior fellows who are tutors. These tutors stand to their pupils *in loco parentis*, and also have charge of their tuition, though each tutor does not necessarily teach his own pupils.

*System.*—To proceed to the degree of A.B., a student must keep terms for four years, two terms at least being necessary in each year. Terms may be kept either by residence, and attendance on lectures, or by simply appearing on a stated day in the public hall, and passing a creditable examination over a prescribed course. Lectures are delivered on the different subjects of each term examination by the tutors, the honour examiners, and the university professors; and prizes of the value of £4 and £2 are awarded at the Michaelmas examination to the *first* and the *second* honour men respectively. In the other terms (Hilary and Trinity), parchment certificates reward the diligent. At the end of the fourth year, gold and silver medals are awarded to the senior and junior moderators. Students of the first year are called junior freshmen; those of the second, senior freshmen; of the third, junior sophisters; and of the fourth, senior sophisters. All students must pursue the following course: *first year*, Latin, Greek, mathematics; *second year*, Latin, Greek, mathematics, logic, and metaphysics; *third year*, Latin, Greek, physics, logic, and metaphysics; *fourth year*, Latin, Greek, physics (both mathematical and experimental), astronomy, and ethics. For those who aspire to honours, the course is much more extensive than that for mere *pass*.

*Degrees.*—Term examinations having been duly passed, the student is promoted to the degree of A.B., which is conferred by the senate in full congregation. The *comitia* for granting degrees are held three times in the year—on Shrove Tuesday, the last Wednesday in Trinity term, and the last Wednesday in Michaelmas term. Those students who, at the final ordeal of the fourth year, stand highest in an examination over an extra course in (1) mathematics and mathematical physics; (2) classics; (3) ethics and logics; (4) experimental and natural science; (5) history, political science, and English literature, are called (according to merit) senior or junior moderators. These form the first class of graduates, the second being called respondents. The third consists of 'unclassed candidates.' The higher degrees are procurable after the lapse of a fixed numbers of years, and on the performance of certain exercises, and the payment of fees.

*Fees.*—For entrance and first half-year the fees are—Noblemen, £60; fellow-commoner, £30; pensioner, £15; sizar, £5, 1*s.* 3*d.* Other half-years, £33, 12*s.*, £16, 16*s.*, and £8, 8*s.*—the sizars being exempt. This does not include rooms and commons. For degrees, the fees for pensioners are—A.B., £8, 17*s.* 6*d.*; A.M., £9, 16*s.* 6*d.*; LL.B., £11, 15*s.*; LL.D., £22; B.D., £13, 15*s.*; D.D., £26; M.B., £11, 15*s.*; M.D., £22.

*Divinity, Medical, and Engineering Schools.*—Connected with Trinity College there are schools for divinity, medicine, and engineering. Graduates in medicine and in engineering must previously graduate in arts. The divinity testimonium is obtained after two years' attendance on lectures, with an examination at the end of each term.

*Church Patronage.*—The university has in its gift 21 valuable church livings, which are, in the first instance, offered to the fellows, should any wish to abandon a college for an ecclesiastical life.

*Studentships.*—In 1859, 14 studentships were founded, worth £100 a year each, tenable for seven years, to encourage graduates in the pursuit of some special branch of study which they may afterwards be called on to teach, should they become fellows and lecturers. Two are given every year, and are open to persons of all religious denominations. The provost and senior fellows are the electors.

*General Remarks.*—The university of Dublin is well equipped for carrying education to a high degree of perfection. The teaching staff is numerous, and in the actual work of tuition, the tutorial and professorial elements are more largely combined than in any other British university. Many distinguished men have, in past generations, gone forth from her halls. The names of Ussher and Berkeley; of Elrington, Lloyd, Magee, Sir W. Hamilton, Romney, Robinson, Maccullagh, Archer Butler; and of Burke, Sheridan, Curran, Swift, and Goldsmith, with a host of others celebrated in politics, in law, in science, and in literature, are sufficient to indicate the success which has attended her sons.

**DUBNI'TZA**, a town of European Turkey, in the province of Rumili, is situated on the banks of the Djerma, a tributary of the Stroma, in lat. 42° 10′ N., and long. 23° 20′ E. It has extensive ironworks, which afford employment to the mass of the inhabitants. Vines are grown in the vicinity. Pop. 6000.

**DU'BNO**, a town in the south-west of European Russia, in the government of Volhynia, is situated on the left bank of a small feeder of the Styr, in lat. 50° 27′ N., and long. 25° 45′ E. It is very irregularly built; its streets are narrow and crooked, and destitute of pavements, and the houses are almost entirely built of wood. The people trade chiefly in corn, flax, tobacco, fish, and cattle. A large fair is also held here at Whitsuntide. Pop. 8000, of whom a great many are Jews.

**DUBOIS**, Guillaume, cardinal, was born 6th September 1656, at Brives-la-Gaillarde, in Auvergne, where his father was an apothecary. At the age of twelve, he came to Paris, and entered the college of Saint Michel, as a domestic of the principal. Here he made such good use of his opportunities for acquiring knowledge, that he was afterwards selected as tutor to the son of a merchant named Mauroy, and gradually rose till he became tutor to the young Duc de Chartres. Although of an ugly exterior, he contrived, by his mixture of wit and hypocrisy, to win the esteem of the boy's mother, while he possessed the most unlimited confidence of his pupil, partly through their common love of letters, and partly because he took upon himself the odious office of pander to his vices. His public career commenced after the marriage of his pupil, in 1692, with Mademoiselle Blois, a natural but legitimatised daughter of Louis XIV. He then received from that monarch for his services in bringing about the match, a gift of the abbey of St Just, in Picardy. He was next attached to the French embassy at the court of London, where he formed some important political connections. On his return, he became private secretary to his old pupil; and when the latter (now Duke of Orleans) became regent in 1715, D. became virtually the most powerful man in France. The great act of his life was the famous treaty signed at La Haye, 14th January 1717, and known as the *triple alliance*, between England, Holland, and France. The importance of this act lies in the circumstance that it effectually changed the foreign policy of France, in spite of the French princes, in spite of the traditions of Louis XIV., in spite of the dislike of the English king for the Regent, and finally, in spite of Cardinal Alberoni himself, the Spanish minister. In reward for his brilliant dexterity, D. received the office of Minister of Foreign Affairs, and in 1720, on the solicitation of George I. of England, was appointed to the vacant archbishopric of Cambray. In 1721, he obtained the cardinal's hat, and in the following year became prime-minister of France, when his authority seemed unbounded. He died 10th August 1723, a victim to hard work and the wildest debauchery.

**DUBO'VKA**, a town of European Russia, in the government of Saratov, is situated on the eastern slope of the Sarpa Hills, on the right bank of the Volga, in lat. about 49° N., and long. 44° 45′ E. It is a dépôt for goods brought from the northern provinces, which it forwards to Katschalinskala, a town about forty miles distant from D., and situated on the Don. The produce is thence conveyed by the Don to the southern provinces. D. has some trade in wood, oil, iron, and manufactured articles. Pop. (1855) 10,000.

**DUCANGE.** See DUFRESNE.

**DU'CAT**, one of the most extensively used names for a coin, mostly of gold. Ducats were first coined in the 12th c. in Sicily, and took their name from the legend found on those early Sicilian pieces: *Sit tibi, Christe, datus, quem tu regis, iste Ducatus* (*ducatus* means duchy). Such coins were extensively issued after the 12th c. in Italy, especially at Venice. Venice ducats were called *Zecchini*, from *Zecca*, where the mint was situated. The ducat was adopted in 1559 by the imperial diet of Germany into the currency of the empire, and was afterwards coined in the several German states, and over the whole of the north of the European continent, Russia included. Many of the German states have ceased to issue ducats. The ducat varies in weight and fineness; by far the most common, which is current in Austria, Russia, Hamburg, &c., weighs 54 troy grains, sterling value about 9*s.* 4*d.* The modern Italian ducat is of much less value. The gold ducat of Venice is valued at 6*s.* In the (late) kingdom of the Two Sicilies, the ducat (ducato del regno) is a silver coin and money of account, forming the unit of the currency, being divided into 100 grani, in the island of Sicily into 100 bajocchi. There are few silver ducats, however, in existence, the common coin being the piastra or dollar = 120 grani. The ducat = 3*s.* 4*d.* sterling. There are various kinds of the Spanish *Ducado*, generally translated dollar. The ducado de plata, or silver ducat, hard = 4*s.* 2*d.*

**DUCA'TO**, CAPE (anciently, *Leuca'tês*), a headland at the southern extremity of a promontory of Santa Maura, one of the Ionian Islands, in lat. 38° 34′ N., and long. 20° 32′ E. Cape D. was in ancient times dreaded by mariners, and the modern Greek sailor still fears the strong currents and the fierce gales which he has to encounter there. A point on the western side of the *Leucadian* promontory is called *Sappho's Leap*, as it was supposed that here the poetess precipitated herself into the sea. It is a white broken cliff, rising perpendicularly from the water to the height of about 2000 feet. On its summit stood a temple dedicated to Apollo, the substructure of which still exists.

**DUCHESNE**, ANDRÉ (in Latin, Andreas Chesnius, or Duchenius, or Quercetanus), the father of French history, was born at Ile-Bouchard, in the old province of Touraine, in May 1584, and studied at Loudun and Paris. History and geography were his favourite studies from his youth, and under Richelieu's ministry he was appointed royal geographer and historiographer. He died 30th May 1640, by a sad accident, having been crushed against a wall by a carriage in a narrow street. His collection of the *Historiæ Francorum Scriptores Coætanei ab ipsius gentis origine ad Philippi IV. tempora* (5 vols., Paris, 1636—1649), is particularly important. It was continued from the third volume by his son, FRANCOIS DUCHESNE (born 1616, died, after having likewise been appointed historiographer, in 1693), and contains much that may be sought for in vain in Bouquet's collection. Of his other numerous writings, we may mention, as deserving of special notice, the *Historiæ Normannorum Scriptores Antiqui* (Paris, 1619); *Histoire Généalogique de la Maison de Montmorency et de Laval* (Paris, 1624); and *Histoire Généalogique de la Maison de Vergi* (Paris, 1625). The last two throw much light upon the history of France. D.'s industry was extraordinary; he is said to have left more than a hundred folios in manuscript.

**DUCHOBORTZI**, a Russian religious sect, of the origin of which nothing is very certainly known, and which, although conjecturally referred by Count Krasinski to the Patarenes (q. v.), cannot be historically traced beyond the middle of the 18th c., when it was found to exist in different parts of Russia; and its members became exposed to penalties by their refusal to serve in the army. The D. hold the doctrine of the Trinity, and are chiefly distinguished by their holding that human souls existed before the creation of the world, and fell in that former existence, from which the fall of Adam and a continual tendency to fall have proceeded; and by their ascribing hidden mysterious meanings to all parts of the Bible, for the knowledge of which they depend on inward light. They are extreme mystics. They reject the use of pictures common in the Russian Greek Church. They neither observe baptism nor the Lord's Supper. In their religious meetings they salute each other with bows and kisses: they pray, sing psalms, and exhort or expound the Scriptures. They are, however, generally very illiterate and ignorant. On the accession of the Emperor Alexander I., they received the most complete toleration, and were allowed to settle by themselves on the bank of the Molochna in the south of Russia. Here, however, an impostor named Kapustin prevailed on them to receive him as a prophet, taught them the transmigration of souls, and made them believe that he himself was animated by the soul of Jesus Christ; and it would appear that, in consequence of disputes arising among them concerning him, great numbers were buried alive, and otherwise put to death by the rest, on which the settlements on the Molochna were broken up in 1841, and great part of the people transferred to the provinces beyond the Caucasus.

**DUCK**, a kind of plain linen of a coarse heavy make, highly glazed, used for smock-frocks by the English agricultural labourers, and for working-dresses by those employed at smelting furnaces and iron forges.

**DUCK.** See ANAS. The broader bill, laminated and not toothed, distinguishes the Linnæan genus *Anas* from *Mergus* (including Smews, Mergansers, and the Goosander). In recent ornithological systems, however, it is divided into numerous genera, but three chief groups are usually recognised, corresponding to swans, geese, and ducks of popular nomenclature. See GOOSE and SWAN. The group to which the name duck is sometimes extended, both by scientific writers and in popular language, is characterised by greater breadth of bill than either the swans or geese. Their food is chiefly animal, whilst that of both swans and geese is in great part vegetable. Their legs are shorter and placed further backward than those of geese, so that they move with greater difficulty and with a more waddling gait on land, and their necks are shorter than those of geese, and much shorter than those of swans, although in this character there is a considerable difference between different species. There is a very marked difference in plumage between the males and females, which is not the case in any corresponding degree in swans and geese. They exhibit also a peculiar anatomical character in a large dilation of their trachea (windpipe) on each side at its bifurcation. This great group of Ducks is subdivided into two sections; one section characterised by a webbed or broadly margined hind-toe, the other by a hind-toe destitute of membrane. These characters are connected with important differences in other respects, and particularly in habits; the ducks of the first section being chiefly oceanic, living more exclusively on animal food, and diving readily and frequently in pursuit of it; whilst those of the second section are more generally inhabitants of lakes and other inland waters, shewing a preference for shallow waters. Those of the first section also have the feet placed further backward than those of the second; those of the second have generally longer wings than those of the first, and a longer neck by which they are adapted for seeking their food by dabbling in muddy shallows, they less frequently dive, and when alarmed generally seek safety by taking wing. Many of both sections are migratory, and spend the summer in arctic and subarctic regions. Not a few of them are common to the northern parts of both the eastern and western continents. Their plumage is remarkably thick, soft, and compact. The tongue, which, unlike that of most birds, is large and fleshy, assists in the selection of food. To the first or oceanic section of ducks belong Scoters, Garrots, Eiders, Pochards, Scaups, Harelds, &c.; to the second section belong Shieldrakes, Shovellers, Musk Ducks, Summer Duck, Pintails, Gadwalls, Teals, Wigeons, Bluewings, &c.—See these articles.

The COMMON DUCK, or DOMESTIC DUCK (*Anas Boschas*), known also in its wild state as the WILD DUCK or MALLARD, belongs to a genus, or sub-genus, of the second section, characterised by a flattish broad bill, longer than the head, not contracted, nor much dilated, towards the tip, and not much elevated at the base, destitute of a tubercle at the base, the denticulations of the upper mandible (ends of the laminæ) scarcely projecting beyond the margin, and a short and rather pointed tail of sixteen feathers. Even as thus characterised, it includes TEALS (q. v.), which are by some ornithologists constituted into a separate genus. The male (drake) of the common duck has the four middle tail-feathers recurved. The deep emerald green of the head and upper part of the neck, the white collar which separates the green from the dark chestnut of the lower part of the neck, and the deep blue iridescent *speculum* of the wing—formed by the outer portion of the outer web of the secondaries—are also marked characteristics of this beautiful bird; the plumage of which exhibits greater brightness of colours—during the breeding season at least—in the wild than in the domestic variety. At the close of the breeding season, the male of the wild-duck assumes for a time a plumage more sober, and resembling that of the female; but before winter, the splendid plumage proper to his sex is again acquired. The mallard or wild-duck is a widely distributed bird, being found in the northern parts of Europe, Asia, and America, and extending southward as far as Florida—where it is abundant—and the West Indies, although in the Old World it is not known as belonging to regions of similar climate. It was formerly much more abundant than it now is in Britain, the drainage of marshes having apparently tended more than any other cause to the diminution of its numbers. Multitudes of mallards, however, still visit the fen counties of England in winter; and great numbers are taken in decoys, along with other *Anatidæ*, and sent to the London market. See WILDFOWL. Many wild-ducks, however, still breed in Britain, sometimes near the lakes or rivers which they frequent, sometimes in more elevated moorish districts, from which the parents often take opportunity of bringing their very young brood to the lower waters, by swimming down the streams on some occasion of their being swollen by rain, and it is interesting to see the little creatures hurried on, without injury, by the current, and passing along narrow rapids and over waterfalls of considerable height, much as pieces of cork might do, and with as little apparent injury. The nest is composed of grass, intermixed and lined with down, and the eggs are usually nine to twelve in number.

This species, in a wild state, always pairs, but in domestication it becomes polygamous, and the care of the young is left entirely to the female. It has been long common in the poultry-yard, being valued for its eggs and its flesh; and there are breeds, as the Aylesbury duck, &c., remarkable for their great size and delicacy of flesh. In situations where they have ready access to a lake, pond, or stream, ducks are easily managed, and very useful poultry. In other circumstances, they cannot be kept with advantage.

The species most nearly allied to the common duck is said to be the JAVANESE DUCK (*A. Javanensis*). The BLACK DUCK or DUSKY DUCK (*A. obscura*) of North America is also very nearly allied to it, and is generally distributed from Labrador to Texas. The Summer Duck or Wood Duck of North America, and the Mandarin Duck or Chinese Duck, belong to a nearly allied genus or sub-genus (*Dendronessa*), with shorter bill and pendant occipital crest. See SUMMER DUCK. The TREE DUCK (q. v.), or WHISTLING DUCK, of the warmer parts of America, also belongs to a distinct but nearly allied genus or sub-genus (*Dendrocygna*).

**DU'CK-BILL** (*Ornithorhynchus*, or *Platypus*), a genus of *Mammalia* of the order *Monotremata* (q. v.). Only one species is fully ascertained (*O. paradoxus*, or *P. anatinus*), generally called WATER MOLE in the Australian colonies. It inhabits the rivers of New Holland and Van Diemen's Land. The first descriptions of this singular quadruped were received with incredulity, and even when a stuffed specimen was brought to England, it was suspected to have been ingeniously fabricated. The whole length, including bill and tail, is usually from 20 to 23 inches. The body is rather long and compressed, thickly covered with very glossy hair, among the roots of which there is a layer of soft short waterproof felt or wadding. The head is small and round, with small bright eyes, and no external ears, although the internal ears are perfectly developed, and the hearing acute; and instead of the muzzle, mouth, and teeth of an ordinary quadruped, the creature is furnished with a bill like that of a duck, but broader in proportion, near the extremity of the upper mandible of which the orifices of the nostrils are placed. The bill is covered with a leathery membrane. There are no true teeth, but the bill has small transverse laminæ, like the bill of a duck; and at its base, on each side of each jaw, are two horny protuberances without roots or bulbs. The tongue is beset with villosities, does not extend to the extremity of the bill, and bears at its base what has been described as another tongue of a thicker form, and with two little fleshy points in front. The legs are short; the forefeet have each five toes, with strong burrowing claws, and a connecting membrane for swimming, which extends even beyond the claws, but is capable of being folded back, so as not to impede their use in burrowing. The hind-feet are smaller than the forefeet; they have each five toes armed with claws, and webbed, but the web does not extend beyond the base of the claws. The hind-feet of the male are armed with sharp spurs, like those of a cock, which are merely rudimentary in the female. These spurs were at one time erroneously supposed to be venomous. The tail is strong, broad, and flattened, about half as long as the body, covered with longer and coarser hairs, and nearly naked on its under surface. The D., besides the characteristics of the *Monotremata*, exhibits other anatomical peculiarities which resemble those of birds, and some—principally osteological—which even resemble those of saurian reptiles. It lives chiefly in the water, and seeks its food by means of its bill in the mud, like ducks. Its food consists chiefly of aquatic insects, molluscs, &c.; but it is said also to feed on small fish, and even on vegetable food; and in confinement, it can be fed on worms, minced meat, or egg, and bread and milk. It makes serpentine burrows of great length—twenty or even fifty feet—in river-banks, entering near the water's edge, and enlarged at the termination into a receptacle or nest, which is furnished with dry weeds for the accommodation both of parents and young. The young are produced in a very imperfect state: the D. is indeed strictly ovoviviparous; the fœtus receives no nutriment from the parent before birth, except what it derives from the ovum, which, however, is hatched within the body of the parent; but the young are suckled, and the mouth is adapted to this by the comparative shortness of the bill and greater length of the tongue at this period of life. The D. is lively and active, and so readily alarmed by the appearance of danger as not to be easily shot, diving before aim can be taken. It is usually to be seen with only its head above the surface of the water. It prefers the twilight to the glare of day. Its voice resembles the growl of a small puppy. It carefully dresses and pecks its fur. When asleep, it rolls itself up into a ball.

Duck-Bill or Water Mole (*Ornithorhynchus paradoxus*).

**DUCK CREEK**, a water-course of Central Australia, is the largest of the channels which drain into the Darling (q. v.).

**DU'CKING-STOOL**, an apparatus at one time in use in Britain for the punishment of scolding wives. The ducking-stool grew out of the cucking-stool, which was not, as many have supposed, a mere difference of name for the same thing. The cucking-stool of itself did not admit of the ducking of its occupants. It was a simple chair in which the offender was placed, usually before her or his (for the cucking-stool was not so specially for women as the ducking-stool) own door, to be pelted and insulted by the mob. In conjunction with another instrument of degradation, however—the tumbrel—the cucking-stool was occasionally used for ducking; but the ducking-stool *par excellence* was specially made for purposes of immersion. There were various examples of the ducking-stool. Sometimes it 'consisted of a rough strong chair attached to one end of a beam, which worked on a pivot on a post bedded into the ground at the edge of the dam,' or the river, as the case might be. 'The woman was placed in the chair with her arms drawn backwards; a bar was placed across her back and in front of her elbows;' another bar held her upright, and there were cords to tie her securely in. The executers of the punishment then took hold of a chain at the opposite end, and gave her a ducking on the 'see-saw' principle.

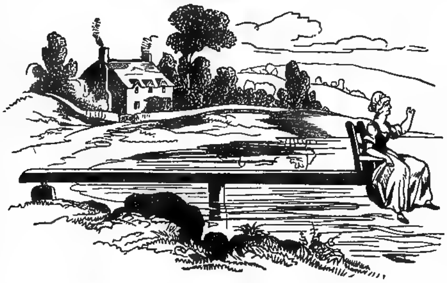


Fig. 1.

Ducking-stool until lately in existence at Broadwater, near Worthing.

Fig. 1 is an illustration of this kind of ducking-stool, which was in use at Broadwater, near Worthing. In fig. 2 there is an example of a tumbrel and ducking-stool combined, which was in use for actual ducking at Leominster as recently as 1809. The beam to which the chair was attached was 23½ feet in length, the ducking being administered in the manner previously described. A representation of a ducking-chair, preserved in the Scarborough Museum, is also given in fig. 2. Other ducking-stools

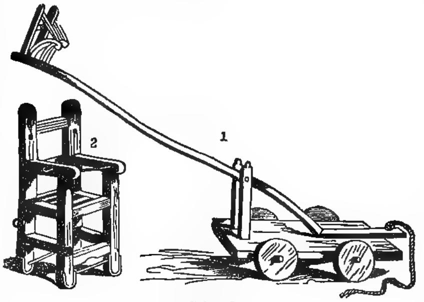


Fig. 2.

1. Tumbrel preserved at Leominster; 2. Ducking-chair in the museum at Scarborough.

consisted of an upright and transverse beam, either movable or fixed, from which the chair was suspended by a rope or chain. The practice of ducking commenced in the latter part of the 15th c., and prevailed generally throughout the kingdom until the first part of the 18th c., and in isolated cases, as we have seen, even into the 19th century.

For the facts of this article, as well as for the cuts, we are indebted to a paper by Mr Llewellynn Jewitt in the *Reliquary* (published monthly at Derby).

**DU'CKWEED** (*Lemna*), a genus of plants, referred by many botanists to the natural order *Araceæ*, but regarded by others as the type of a small natural order, *Lemnaceæ*, which consists chiefly of floating plants, mere flat green fronds, with roots hanging loosely in the water, and unisexual flowers—destitute of calyx and corolla—bursting through a membranous spathe in their margin. The *Lemnaceæ* are distributed throughout all parts of the world. Several species of D. are British, and cover the surface of stagnant ponds with green vegetation. Their flowers and fruit are rarely to be seen, but they spread rapidly by new fronds budding from their margins.

**DUCTI'LITY** is that property of bodies by which they are capable of being drawn out in length, while diminishing in breadth, without fracture or separation of their parts. Ductility is peculiarly noticeable in the case of metals. It is possessed also by gums, glues, resins, and some other bodies, which, when softened by water or heat, may be drawn into threads. Clays, when moistened, become ductile. Metals are ductile, generally speaking, at any temperature, but their ductility is much influenced by temperature; some—brass, for example—are more ductile at ordinary temperatures than when hot. Metals are ductile nearly in the order of their Malleability (q. v.), the order of their ductility being as follows, beginning with the highest: gold, silver, platinum, iron, copper, zinc, tin, lead, nickel, palladium, cadmium. Some, however, as iron, are more ductile than malleable. The ductility of gold and glass is surprising; see article DIVISIBILITY for an account of the fineness to which gold-gilt silver wire and glass tubes have been drawn. The ductility of glass at red heat seems to have no limit; at high temperatures, this brittle substance may be drawn into threads finer than any hair, and of the highest flexibility. Its flexibility, indeed, according to some, increases in proportion to the fineness to which its threads are drawn, and it is conceived to be possible that we may yet convert glass into cloths for wearing apparel.

**DU DEFFAND**, MARIE DE VICHY CHAMROND, MARQUISE, a celebrated Frenchwoman, was born of a noble family of Burgundy in 1697, and educated at the convent of La Madeleine de Trenelle, in Paris. Here she manifested that boldness of opinion and vivacity of intellect which obtained for her so many distinguished admirers in after-years. Her parents, alarmed at her scepticism, sent the eloquent Massillon to converse with her, who was, however, more struck with the wit and beauty of the young lady, than she was with the force of his arguments. In 1718, she married the Marquis Du Deffand. The union was unhappy, and a separation took place, whereupon the Marquise threw herself into all the excesses of gallantry which characterised French society in the 18th c., and had the name of being, for a time, the mistress of the Regent. Subsequently, a reconciliation took place between her and her husband, but it lasted only a short period. She then set up an establishment of her own, and gathered round her all the wits, philosophers, and men of fashion in her day. Among her friends and correspondents may be mentioned D'Alembert, Voltaire, President Hénault, Montesquieu, Marmontel, and Walpole. Her evening-parties at her residence in the Rue St Dominique were famous. They formed a rendezvous for all the notabilities of Paris, and were much relished by distinguished foreigners visiting the city. In 1753, she became blind, and in the following year chose as companion and reader a young lady, Mademoiselle de l'Espinasse, of whom, however, she became very jealous, on account of the attentions paid to her by the friends of the marquise. In 1764, the two ladies separated, Mademoiselle de l'Espinasse carrying with her a large number of enthusiastic partisans, who deserted the saloon in the Rue St Dominique, at the head of whom was D'Alembert. The Marquise Du D. died 24th September 1780. Her correspondence with D'Alembert, President Hénault, Montesquieu, and the Duchesse du Maine was published in 1809; and in the following year appeared at London her correspondence with Horace Walpole (written between 1766 and 1780), to which were added her letters to Voltaire.

**DUDEVANT**, AMANTINE LUCILE AURORE, MADAME, a French authoress, who has attained an extraordinary celebrity under the name of GEORGE SAND. She was born at Paris in 1804, and is descended by the father's side from the famous Marshal de Saxe. Her maiden name was Dupin. After having received a strict conventual education (1817—1820), she married M. Dudevant in 1822; but in the course of a few years, finding the lack of congeniality of sentiment intolerable, she arranged a separation with her husband in 1831, and repaired to Paris, where at first she was hard pushed to secure a livelihood. Her first literary efforts made their appearance in the *Figaro*. In conjunction with her friend and companion for the time, Jules Sandeau, from whose name she formed her *nom de plume*, she wrote a romance, entitled *Rose et Blanche* (1832), which only occasionally rises above mediocrity, and gave no hint of the splendid ability first fully developed in *Indiana*, published in the same year. This romance, in which a glowing heart, deeply wounded by the pressure of social relations, gives vent to its feelings, excited considerable interest. This was increased to the utmost by the succeeding romances—*Valentine* (1832), *Lélia* (1833), *Jacques* (1834), *André* (1835), *Leone Leoni* (1835), and *Simon* (1836). During the next two years, she published a great variety of works, in which she shewed herself to be deeply influenced by the age in which she was living. In addition to her purely imaginative productions, Madame D. found time to contribute miscellaneous essays and political articles to the journal entitled *Le Monde*, so long as it was edited by Lammenais. She was much occupied at this time with philosophical and theological speculations, and their influence may be traced in the *Spiridion* (1839), and the extraordinary piece of prose poetry, entitled *Les Sept Cordes de la Lyre* (1840). She cherished, moreover, republican ideas of the wildest nature, which appeared conspicuously in the *Compagnon du Tour de France* (1840), and in *Pauline*. Her brilliant literary success having now placed her in comfortable circumstances, she obtained a legal divorce from her husband, and thus secured possession of a portion of the property which she had brought to him as her dowry. She now occupied herself with the education of her two children, and spent her time, sometimes in Paris, sometimes at her estate in Berri, where she had passed her childhood, or in journeys into Switzerland and Italy. A dispute with the editors of the *Revue des Deux Mondes*, which, from 1833 to 1841, had regularly published her works in chapters before they appeared in a separate form, induced her to start the *Revue Indépendante*, in conjunction with P. Leroux and Viardot. For this new review, she wrote *Horace*, *Consuelo*—her best known, and probably her finest work—and *La Comtesse de Rudolstadt* (1842—1843), three romances deeply imbued with democratic feelings and sentiments, which are apparent likewise in *Jeanne* (1844), and which in the *Meunier d'Angibault* (1845), becomes altogether socialistic. It would be impossible to enumerate the works which flowed from her rapid pen between this period and the revolution of 1848. It is sufficient to say that her socialistic sympathies predominate in all of them; but if the logic is not convincing, the vigour and purity of her imagination are undeniable. This is always the case with Madame Dudevant. Even those who disapprove of her exaggerated and one-sided ideas and views of life, must admire the perfect form, the captivating style, the plastic finish, and the great affluence of thought and sentiment displayed in all her productions. Her finest romances are *Valentine*, *André*, and, in particular parts, *Consuelo*. Of her smaller pieces, *La Mare au Diable* is a master-piece of its kind, and indeed, considered from an æsthetic point of view, is, with respect to plan and execution, the most complete production of her pen. After the revolution of February, Madame D. for a short time wasted her talents on the barren politics of the day; since then, she has devoted herself chiefly to the stage, without achieving any great success, mainly, however, on account of the excess of the lyrical over the dramatic in her genius. In 1854, she commenced in the *Presse*, *Histoire de Ma Vie*, which is not yet finished.

**DU'DLEY**, a parliamentary borough in a detached part of Worcestershire, in the south of Staffordshire, 26 miles north-north-east of Worcester, and 8½ miles west-north-west of Birmingham. It is a well-built town, and a chief seat of the iron trade. On the north-east of the town are the beautiful ruins of an old castle, founded in 760 by Dodo, a Saxon prince. It was demolished in the time of the civil wars of Charles I., was rebuilt, but was afterwards burned down in 1750. In the vicinity are iron and coal mines, and limestone quarries. The limestone is Silurian and full of organic remains; it is wrought out of caverns, and brought to the kilns through a tunnel one mile and three-quarters long, which is carried through the basalt of the Castle Hill. Saline springs occur near. The chief manufactures are fire-irons, grates, nails, vices, chain-cables, other iron utensils, and glass. Pop. (1861) 44,975. D. sends one member to parliament. The living is a vicarage in the gift of the Earl of Dudley, and valued at £1000 per annum.

**DUDLEY LIMESTONE**, a highly fossiliferous Silurian limestone belonging to the Wenlock Series (q. v.), which forms some of the most picturesque eminences around the town of Dudley. The masses of corals, shells, and trilobites which abound in this rock, form, when weathered, extremely beautiful cabinet specimens.

**DUDLEY LOCUST**, the popular name for a trilobite (*Calymena Blumenbachii*, q. v.), which is very abundant in the Dudley limestone.

**DU'EL** (Fr. *duel*, Lat. *duellum* or *dvellum*, which, as Cicero remarks [*Orat.* 45], was the old form of *bellum*, war), a combat between two persons, at a time and place indicated in the challenge, cartel, or defiance borne by one party to the other. A duel generally takes place in the presence of witnesses, called seconds, who regulate the mode of fighting, place the weapons in the hands of the combatants, and enforce compliance with the rules which they have laid down.

No trace of the duel, as an institution, is to be found in the history of the classical nations of antiquity, the Latin word from which ours is derived having been used to signify a war between two nations. So long as men continued to be barbarians, their personal quarrels were no doubt decided in the ancient, as national quarrels still are in the modern world, by an appeal to physical force. But though war has been in all times the practical solution of strife, it was not till the middle ages that it came to be regarded as a means, in any sense judicial, of settling disputes. Hitherto, it had determined who was able to prevail, justice being set aside, but it was a new view that it would determine who ought to prevail on the principles of justice. The rationale of the *judicial combat* or wager of battle was probably twofold. On the one hand, and generally amongst the people, it depended on a belief that God would interfere directly and miraculously in the conflict to protect the innocent, and to punish the guilty, and that thus the weakest combatant who had God on his side would prove more than a match for the strongest, when destitute of His aid. But there was a view of the matter which was not so directly superstitious, and which rested rather on a confusion between the principle of the original constitution and the principle of the transmission of rights. All human rights originate in the powers and faculties which God has given to man, and it was supposed that as the right originated in power, its continued existence in the individual could be ascertained by ascertaining whether the power still existed in him. The error consisted, as we have said, in confounding the principle of the constitution with the principle of the transmission of rights. If a field which was claimed by two competitors had as yet been appropriated to nobody, or had been abandoned, and was, as lawyers say, *res nullius*, the fact of which of the two claimants ought to become the possessor might be ascertained by judicial combat. But if it was already the property of one of them on a title which was to be held sacred, and the question was which of the two had this sacred title, that fact could never be determined by ascertaining which would have been in a condition to constitute it for the first time, had it been non-existent. The principle of the private duel, in so far as it had any principle at all, and was not merely a piece of barbarous and irrational foppery, was precisely the same as that of the judicial combat. But the latter had been applied to a class of cases which admitted of legal investigation and decision, and it was consequently abandoned in the days of Queen Elizabeth; whereas the former was supposed to be a means of redressing wrongs which hardly can come within the cognizance of a human tribunal, and the consequence was that it continued in green observance in this country until recently, and is still in vigour in many continental countries.

Like the other peculiarities of medieval life, the duel probably originated with the Germanic nations. It is said to have been introduced into legal proceedings in lieu of an oath by Gundebald, king of the Burgundians, in 501. Louis le Débonnaire was the first of the French kings who permitted litigants to appeal to arms. The practice was prohibited by Henry II., in consequence of a noted duel which took place in his presence between his friend, Francis de la Chastaignerie, and Guy Chabot de Jarnac, in which the latter was slain. The royal edict, however, was totally ineffectual, and the practice of private duelling has generally prevailed more extensively in France than in any other country. Francis I. patronised it by declaring that a lie could be borne without satisfaction only by a base-born churl, and still more by the example which he set in challenging his own great rival Charles V. In 1599, the parliament of Paris declared all persons who were either principals or seconds in duels to be rebels to the king. But its efforts were unavailing; and it is said that during the first 18 years of Henry IV., no fewer than 4000 gentlemen perished in this foolish manner. In 1609, Henry added to the existing penalties, introducing even punishment by death in extreme cases. But these regulations were forced upon him by popular feeling; he had himself no aversion to the practice, and when he gave permission to Crequi to fight Don Philip of Savoy, he added: 'If I were not the king, I would be your second.' The consequence of this feeling was, that he readily granted pardons to those who had violated the laws which he had been forced to enact, and these laws not unnaturally produced an effect the very reverse of their ostensible object. Duelling acquired the charm of what the French call 'forbidden fruit,' and thus became a fashionable and favourite vice. In the reign of Louis XIII., the custom was so prevalent, that Lord Herbert, the English ambassador, wrote home to his court that there was scarcely a Frenchman worth looking on who had not killed his man. It would not seem, however, that it was from negligence in enforcing the royal edicts that duelling then reached to so alarming a height; for it was during this reign that two noblemen, the greatest duellists of the day, the Count de Boutteville and the Marquis de Beuron, were tried and beheaded for persisting to fight. In the commencement of the reign of Louis XIV., duels with four or five a side began to be fought; and two very sanguinary affairs of this description having taken place, in which several persons of the highest rank were slain, the king determined to put an end to the practice. He published an edict in 1679, forbidding it under the highest penalties, which, unlike most of his predecessors, he had the firmness to inflict; and this measure, together with a solemn agreement which was entered into amongst the nobility themselves, led at that time to its almost total abolition.

The duel does not seem to have existed in England in Anglo-Saxon times, and was probably introduced at the Conquest. In its judicial form, it was not entirely obsolete in the reign of Queen Elizabeth; and Sir Henry Spelman gives an account of a trial by battle, which terminated, however, without actual combat, in the year 1571. See Battel, Trial by. Private duelling was common, however, both in Elizabeth's reign and in that of her successor, by whom a severe statute against it was enacted in Scotland (1600 c. 12). During the Civil Wars, men's minds were too much occupied with questions of grave importance to leave time for questions of etiquette, and the duel consequently declined; but it became exceedingly prevalent during the dissolute reign of Charles II. Some attempts were made to suppress it in the reign of William III., both in England and Scotland, and, in 1712, the subject was recommended to the attention of parliament in the Queen's speech. But the bill which was brought in by the government was thrown out, and the practice continued to prevail. When the custom of wearing the sword was abandoned, the number of duels diminished, though it was then that their irrational character may be said to have attained its maximum. The pistol was substituted for the sword, and the doctrine of chance—which was reduced to an absurdity by the medical duel of a couple of pills, one composed of bread and the other of poison—was inaugurated. Since this period, the practice has fallen into disrepute, by the gradual operation of public opinion, and in this country it may probably be now regarded as finally abolished. By the law of this country, the act of killing in a duel has always been regarded as murder, however fair the duel may have been; but whilst the practice was countenanced by public opinion, it was generally found impossible to induce a jury to convict. That a verdict of acquittal could not be looked for with the same security in the present day, is probably a pretty good guarantee for the practice not again making its appearance even in exceptional instances. In France it still prevails to a certain extent.

The duels of the students at the German universities, of which so much used to be said and written in this country, were nothing more than fencing-matches with sharp weapons. They were foolish, but not deadly affairs, as the seconds, who were also armed, always interfered to prevent serious bloodshed.

In 1844, several new Articles of War were issued by the Commander of the Forces, with a view to the abatement of duelling in the army.

1. Every officer who shall send a challenge, or who shall accept a challenge to fight a duel with another officer, or who, being privy to an intention to fight a duel, shall not take active measures to prevent such duel, or who shall upbraid another for refusing or not giving a challenge, or who shall reject or advise the rejection of a reasonable proposition made for the honourable adjustment of a difference, shall be liable, if convicted before a general court-martial, to be cashiered, or suffer such other punishment as the court may award.

2. In the event of an officer being brought to a court-martial for having acted as a second in a duel, if it appear that such officer exerted himself strenuously to bring about an honourable adjustment of the difference, but failed through the unwillingness of the adverse parties, then such officer is to suffer such punishment as the court shall award.

3. Approbation is expressed of the conduct of those who, having had the misfortune to give offence to, or injure or insult others, shall frankly explain, apologise, or offer redress for the same, or who, having received offence, shall cordially accept frank explanations or apologies for the same; or, if such apologies are refused to be made or accepted, shall submit the matter to the commanding officer; and, lastly, all officers and soldiers are acquitted of disgrace or disadvantage, who, being willing to make or accept such redress, refuse to accept challenges, as they will only have acted as is suitable to the character of honourable men, and have done their duty as good soldiers who subject themselves to discipline.

Partly in consequence of these regulations, but still more as a result of the increasing reason and humanity of English society, the practice of duelling has become almost as entirely obsolete in the British army as it has in the country generally. See Ordeal.

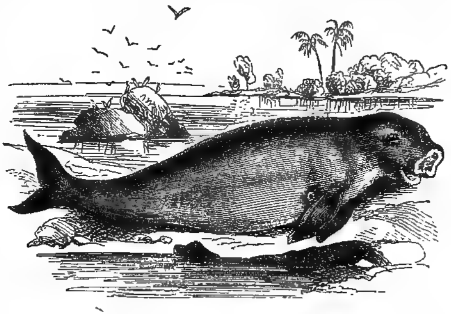
**DÜE'T**, in Music, a composition for two voices or instruments.

**DUFF, Alexander**, D.D., who has so thoroughly identified himself with the cause of Indian missions, was born in 1808 at Pitlochry, a village in Perthshire. He studied at the university of St Andrews with great success. In 1829 he resolved to go out to India as a missionary from the Church of Scotland; and in October of that year, having been previously ordained, he set sail from Portsmouth for India. On the passage out, he was wrecked on a barren island to the north of the Cape of Good Hope, and at length reached his destination after a disastrous voyage of eight months. At the Disruption in 1843, the missionaries in India being obliged to declare with which party they would connect themselves, D. resolved to cast in his lot with the Free Church, and since that date he has carried on with great energy the missionary work at Calcutta under the auspices of that body. In the year 1837, he received the degree of D.D., in acknowledgment of his distinguished services. D. has been twice in his native land since his departure in 1829; on the occasion of his last visit to Scotland, he was appointed Moderator of the General Assembly of the Free Church which met in Edinburgh in May 1851. He is the author of numerous works bearing upon the subject of missions: of these the principal are *New Era of the English Language and Literature* (Edin. 1837); *Missions the Chief End of the Christian Church* (Edin. 1839), *India and Indian Missions* (1839); *The Jesuits, their Origin*, &c. (second edition, 1845); *Missionary Addresses* (1850); *The Indian Rebellion, its Causes and Results* (1858). *The Calcutta Review*, a periodical of great ability, was established mainly through the exertions of Dr Duff.

**DUFRESNE**, CHARLES, SEIGNEUR DU CANGE, hence generally styled merely DUCANGE, a French author, distinguished by his historical and linguistic writings, belonged to an ancient family of Picardy, and was born at Amiens, 18th December 1610. After having received the rudiments of a scientific education at the Jesuits' College in his native town, he studied law at Orleans, and in 1631 became parliamentary advocate at Paris, where he continued to reside till his death, 23d October 1688. There was scarcely any branch of science with which he was unacquainted, but his favourite studies were classical philology and history. Among his historical works may be mentioned the *Histoire de l'Empire de Constantinople sous les Empereurs François* (Paris, 1657). He also edited, along with other scholars, the *Corpus Historiæ Byzantinæ* (Paris, 1680), and Joinville's *Histoire de Saint Louis, Roi de France.* His two principal works, however, are the *Glossarium ad Scriptores Mediæ et Infimæ Latinitatis* (3 vols. fol., Paris, 1678; much enlarged by the Benedictines of St Maur, 6 vols. fol., Paris, 1733—1736, to which four supplementary volumes were afterwards added by Carpentier, a Benedictine), and the *Glossarium ad Scriptores Mediæ et Infimæ Græcitatis* (Paris, 1688). Both works display great learning, good judgment, and admirable industry, and are extremely valuable contributions to the study of the history and antiquities of the middle ages. A new edition of the Latin Glossary, incorporating all the previous supplements, together with additions of his own, was published by G. A. Henschel (7 vols. 4to, Paris, 1842—1853); and a supplementary volume (*Latino-Germanicum*) has since been added by Diefenbach (Francf. 1857). D. left a large quantity of valuable manuscripts, which have been collected in the Imperial Library at Paris.

**DU'GDALE**, SIR WILLIAM, a celebrated antiquary and historian, was born in 1605 at Shustoke, near Coleshill, Warwickshire. He was educated for some time at the free school of Coventry, but left it at the age of 15, and continued his studies under the care of his father, who, having a decided predilection for the branches of civil law and history, seems to have encouraged similar tastes in his son. His antiquarian pursuits led to his being created (1638) a pursuivant-at-arms extraordinary by the name of Blanche Lyon; and shortly afterwards, he was made Rouge Croix pursuivant-in-ordinary. During the civil war, D. adhered to the royal cause, and lived for several years in Oxford, employed in researches for his great works. On the restoration, D. was made Norroy King of Arms, and in 1677 Garter King of Arms; at the same time, the king, much against the wishes of D., whose estate was but a poor one, conferred upon him the honour of knighthood. He died at his estate of Blythe Hall, February 10, 1686. His chief works are *Monasticon Anglicanum* (Lond. 1655—1661—1673), (which, though for the most part written by another antiquary, named Dodsworth, was concluded, arranged, indexed, and corrected by D.); a new and greatly enlarged edition of the *Monasticon* by Bandinel, Caley, and Ellis, was published in 1817—1830, and re-issued in 1846; *The Antiquities of Warwickshire* (1656; second edition revised and continued, 1730); *The Baronage of England* (1675—1676); *Origines Juridicales, or Historical Memoirs of the English Laws*, &c. (1666; 3d edit. 1680); *Short View of the Late Troubles in England* (Oxford, 1681); *The Ancient Usage in Bearing Arms* (1682; new edition, 1811). D. bequeathed upwards of 27 folio MS. volumes, written in his own hand, to the university of Oxford. They are now in the Bodleian Library, the Heralds' College, and the Ashmolean Museum.

**DUGO'NG** (*Halicore*), a genus of mammalia, of the family *Manatidæ* (q. v.), or Herbivorous Cetacea, distinguished by molar teeth with flat summits, and composed of two cones laterally united, the incisors of the upper jaw elongated almost into tusks; the tail forked or crescent-shaped; and the swimming paws destitute of any vestiges of nails. One species alone has been thoroughly ascertained and accurately described. The D. (*H. Indicus*, or *H. Dugong*) of the Indian Archipelago is said to attain a length of 20 feet when full grown, although it is more frequently seen of only 8 to 12 feet long. In general form, it much resembles the manatee. The skull is remarkable for the sudden bending downwards of the upper jaw almost at a right angle. The upper lip is large, thick, and fleshy, covering the prominent incisors, and forming a kind of snout, 'something like the trunk of the elephant cut short across.' The eyes are very small, and are furnished with a third eyelid or *nictitating membrane.* The skin is smooth and thick, but yields no oil. The anatomy of the D. has been very carefully examined. It exhibits a very remarkable peculiarity, in the ventricles of the heart being completely detached from one another. Its osteology has been found to exhibit interesting points of correspondence with that of the *Pachydermata*, as in the numerous ribs, &c.; its dentition resembles in some particulars that of the elephant; its digestive apparatus is adapted to vegetable food,



Dugong (*Halicore Indicus*).

differing very much from that of the whales, dolphins, and other ordinary cetaceans. It feeds on the algæ which grow on submarine rocks in shallow seas. Its lips are of much use in gathering together its food. It often comes to the surface to breathe, and is said to utter a peculiar cry. It is gregarious. The female produces one young one at a birth, and shews an affection for it which is proverbial among the Malays. When the young one is taken, the mother is easily secured. The D. is generally pursued in boats, and killed by spearing. The flesh is highly esteemed even by Europeans, and is described as resembling young beef. That of full-grown animals is, however, comparatively coarse, on which account, and the greater facility of capture, the younger ones are more frequently killed. According to Rüppell, it was with the skin of the D. of the Red Sea that the Jews were directed to veil the tabernacle.

**DUGUAY TROUIN**, René, one of the most celebrated naval officers of France, was born 10th June 1673, at St Malo, left the school at Caen, where he was to have studied theology, with the reputation of a good-for-nothing fellow, and betook himself to the sea. His career, which was very brilliant, may be divided into two parts, the first extending from 1689 to 1697, and the second from 1697 to the close of his life. During the former, he cruised about as a sort of privateer, inflicting immense damage on the enemies of France. The English merchantmen suffered severely from his attacks. In the Channel, on the coasts of Ireland and Holland, in the Spanish Main, everywhere fortune followed Duguay. Louis XIV., as a reward for his daring exploits, admitted him into the state navy, and gave him the command of a frigate. The second part of his career was as brilliant as the first. In 1707, he engaged a part of the English fleet at the entrance of the Channel, burned one ship, captured three others, and about 60 transports; but the most glorious of his triumphs was the attack and capture of Rio Janeiro in 1711, after hostilities had lasted for eleven days. The city was ransomed for 610,000 cruzades. The South American expedition of D. T., which cost Portugal in all about 30,000,000 francs, put the seal to the celebrity of the French commander. He was successively named *chef d'escadre*, member of the council of the Indies, lieutenant-general, and naval commandant at Brest. In 1731, Louis XV. sent D. T. into the Levant, to chastise the barbarians inhabiting the neighbouring coasts, and to obtain reparation for the damages done to French commerce. In this also D. T. was successful. He died 27th September 1736. His *Mêmoires* were published by Beauchamps (4 vols., Paris, 1740).

**DUI'DA**, a mountain of Venezuela, in South America, stands in lat. 3° 30′ N., and long. 66° 10′ W. It is of conspicuous form, being perpendicular on two sides, and bare at the summit. Rising, moreover, to the height of 8500 feet, it forms a safe landmark for the voyager on the Orinoco.

**DU'ISBURG**, a town of Rhenish Prussia, about 15 miles north of Düsseldorf, is situated in a fertile district, between the Ruhr and the Rhine, which unite about three miles below this town. It is surrounded partly by walls, flanked with towers, which are now somewhat decayed, and partly by a rampart and ditches. D. contains a gymnasium founded in 1599, a monastery of Minorites, and five churches, two of which—that of St John the Baptist, dating from 1187, and St Salvador's, a handsome specimen of the architecture of the 15th c.—are worthy of notice. The manufactures of D. consist chiefly of cotton cloths, hosiery, glue, soap, starch, and leather; there is also a large trade in wine and colonial produce, grain, and cattle. In the neighbourhood are ironworks. Pop. 11,629. D. is an ancient town. In the 13th c., it was a member of the Hanseatic League, and afterwards a free town of the German empire, but at the close of the war in 1815 it was handed over to Prussia.

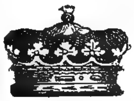
**DUKE** (Fr. *duc*, Lat. *dux*, from *ducere*, to lead), a term applied originally to any military leader. Gibbon informs us that the title came first into use when Constantine separated the civil and the military commands in the provinces, which had been exercised in common by such men as Agricola. From that time forth, the military governors of provinces were either counts or dukes. But these titles originally stood to each other in an opposite relation to that which they afterwards assumed. 'It should be recollected,' says Gibbon (iii. 57, cap. xvii.), 'that the second of these appellations—that of duke—is only a corruption of the Latin word, which was indiscriminately applied to any military chief. All provincial generals were therefore *dukes*, but no more than ten among them were dignified with the rank of *counts*, or companions, a title of honour, or rather of favour, which had been recently invented in the court of Constantine.' See COUNT. 'A gold belt,' continues Gibbon, 'was the ensign which distinguished the office of the counts and dukes; and, besides their pay, they received a liberal allowance, sufficient to maintain 190 servants and 158 horses. They were strictly prohibited from interfering in any matter which related to the administration of justice or the revenue; and the command which they exercised over the troops of their department, was independent of the authority of the magistrates.' When the Goths, and Franks, and other barbarians successfully invaded the provinces of the empire, they preserved the titles of count and duke, if they had not already borrowed them from the Romans. But amongst races who owed their supremacy to the sword, no dignity could prevail over that of the commander of an army; and the dukes, as military chiefs, acquired a marked pre-eminence over the counts, whose lofty functions under the empire had been partly of a civil, and partly of a military nature. The only exception under the first Merovingians was in the case of the Count of the Palace. See COUNT. In the hierarchy observed by the Franks and other Teutonic races, the ordinary count became the lieutenant of the duke, and the government of the latter extended to several provinces; whereas that of the former was confined to one province, or even to a single locality. The power of the dukes grew so rapidly, in consequence of the dissensions of the Merovingians, that, towards the end of the sixth c. (582), they arrogated to themselves the right to dispose of the crown. Amongst the causes which tended to raise the power of the dukes, was the immense wealth which had been acquired by the great provincial families. The chiefs who had attached themselves to the fortunes of Clovis had been richly endowed with conquered lands. After the close of the 7th c., they overshadowed the crown, and the title of prince and chief (*chef*) began to be attributed to them. It has been said that the *ducs-maires* of the palace sometimes assumed the title of Archduke (q. v.). Under the second dynasty, the title of duke retained all its dignity and importance, and it was to the successive invasions of local upon central power, that feudality owed its origin. The concession, tacit or express, of hereditary power and independent jurisdiction, first to the central province known as the Isle of France, and then to Aquitaine, extended itself, under the Carlovingians, to Burgundy, Normandy, and Gascony; and on the accession of Hugo Capet, to all the other subaltern tenures. Once become unlimited masters of their respective legations, the dukes did not long delay to proclaim their title to be as good as that of the king. They assumed the crown and the sceptre, promulgated laws for their subjects, struck money with their own image, and made war in their own name against the crown, with whom they balanced and several times divided the supreme authority. The confederation of the feudal lords had assumed such dimensions, that about the period of the Norman invasion of England nothing remained directly under the crown except a few towns, of which Rheims and Laon were the chief. The rest of the kingdom was divided amongst the dukes and the counts, under an obligation, which they almost always evaded, of service and fidelity to the crown. But the Capetiens had been enlightened by the fall of two dynasties, and were careful to delegate to no other hands the duchy of the Isle of France, which had so often been a stepping-stone to the throne. When it became extinct in 887, it was not re-established, and that event was the signal for the restoration of a national character to France. The duchy of Gascony was joined to Aquitaine in 1052; and both provinces, along with Normandy, were finally re-united to the crown, in 1204, by confiscation. This latter duchy was sometimes given to princes of the blood, but without any separation of its fiscal arrangements from those of the kingdom. A part of Aquitaine was given up to England in 1259, and again ceded to France in 1453. The ducal sovereignty of Burgundy was extinguished in 1477, that of Brittany in 1514, of Narbonne in 1229, and of Toulouse in 1361.

The duchies which were subsequently granted to members of the royal family—that of Bourbon, erected in 1327; of Orleans, in 1344; of Auvergne, Berri, Touraine, Valois, and Alençon, at subsequent periods—enjoyed none of the privileges of independent sovereignty which had belonged to the ancient duchies. The subordination of these fiefs was absolute, and the princes who governed them, though placed on the steps of the throne, were only the first subjects of the realm. The tendency to diminish the actual power which anciently had attached to the ducal title, was still more apparent in the case of those dukedoms which were conferred on the representatives of illustrious noble families. The Montmorencies were created dukes in 1551, but they enjoyed no other privileges than those of titled nobles, and their position had no analogy whatever to that of the old provincial dukes. The duke-peers, as they were called, were simply the first class of nobles in France, just as dukes are with us in England; but they differed from English dukes, in that, after the extinction of the Comté pairie d'Eu, in 1775, the duke-peers alone sat in parliament. Several prelates enjoyed this rank—as, for example, the Archbishop-duke of Rheims, the Bishop-duke of Laon, and the Bishop-duke of Langres. The Archbishop of Paris took the same rank after the erection of St Cloud into a ducal peerage in 1674. There were still two other sorts of dukes in France—the dukes who were not hereditary peers, and the dukes for life, or patent dukes, who date only from the reign of Louis XIV. Swept away by the Revolution, the title was restored by Napoleon, who conferred it, with rich endowments, on his marshals. Several ducal peers were created by Louis XVIII. and Charles X.

In Germany, the dukedom passed through phases very similar to those which it exhibited in the earlier history of France. What is special to the position of the nobility of that country, will be stated under Graf (q. v.).

Dukes, in the older European sense, do not appear ever to have existed in England. The title seems not to have been known earlier than the reign of Edward III., and from the first it was a mere honorary distinction. The Black Prince, who was created Duke of Cornwall (see below) in 1335, was the first English duke. In 1350, Henry, the king's cousin, was created Duke of Lancaster; and when he died, and his daughter was married to John of Gaunt, the king's son, the title was transferred to him—his elder brother, Lionel, being made Duke of Clarence. In the succeeding reign—that of Richard II.—the two younger sons of Edward III. were created, the one Duke of York, and the other Duke of Gloucester. The dignity was thus, in the first instance, confined to the royal house. But the families of Holland and Mowbray very soon received the same title; and one of the Beauforts, an illegitimate son of John of Gaunt, was raised to the peerage by the title of Duke of Exeter. In the reign of Henry VI., the title was granted more widely, and there were at one time ten duchesses in his court. The Staffords, Beauchamps, and De la Poles, belong to this period. King Henry VIII. created only two dukes—the one was his illegitimate son, whom he made Duke of Richmond; and the other Charles Brandon, who married his sister, the French queen, and was made Duke of Somerset. Queen Elizabeth found only one duke when she came to the throne—Thomas Howard, Duke of Norfolk—attainder or failure of male issue having extinguished the rest of them. After the attainder and execution of the Duke of Norfolk, there was no duke in England, except the king's sons, till Ludovic Stuart, a relative of the king's, was made Duke of Richmond in 1623. In 1623, Villiers was made Duke of Buckingham. On the Restoration, Charles II. restored the Seymours to the rank of Dukes of Somerset, and created Monk Duke of Albemarle. But the habit of conferring this dignity on the illegitimate sons of the monarch was still adhered to, as in the case of the Duke of Monmouth, who was the illegitimate son of Charles II.; and the Duke of Berwick, of James II. Of the existing dukes besides the descendants of Charles II., there are only three families which date their dukedoms before the Revolution—viz., the Howards, the Seymours, and the Somersets. It was William and Anne who, by advancing a very considerable number of the first families of peers to the rank of duke, altogether changed its character. There are now 21 English dukes, 7 Scottish, and 1 Irish. The limitation in the patents of dukes is generally to heirs-male of the body.

The **Ducal Coronet** is composed of a circle of gold, with eight strawberry or parsley leaves, of equal height above the rim.



Ducal Coronet.

**Duke of Cornwall.** The duchy of Cornwall was by royal charter of Edward III. conferred on his son Edward the Black Prince. King Henry IV. subsequently included the D. of C. in a patent in favour of his son Henry Prince of Wales. But since that time, the duchy has belonged of right, without any special grant, to the king's heir-apparent from the time of his birth. On the death of the king's eldest son without issue, during the life of his father, the duchy descends to the next brother. In the event of the death of the heir-apparent without issue, and without leaving a younger brother, or in case of the heir-apparent succeeding to the crown, the duchy of Cornwall merges in the crown until the birth of a son calls it again into existence. The uncertainty thus arising in regard to the duchy has produced much confusion in regard to leases held of the duke, and various acts of parliament have been passed, from the 21 James I. to the reign of the present Queen, to regulate this matter. The D. of C. formerly possessed 'royal jurisdiction and crown rights, giving liberty to send burgesses to parliament, and appointing the sheriffs, admirals, and other officers.'—Carew's *Cornwall.* At the present day, there is a separate chancellor, and attorney and solicitor general for the D. of Cornwall. The revenues of the duchy are considerable, arising partly from the rents, &c., of the different manors, and partly from the dues on tin, which is produced in large quantities from the Cornish mines. There is a special court for the settlement of questions arising among the miners, called the Stannaries Court (q. v.).

**DUKE OF EXETER'S DAUGHTER**, an instrument of torture resembling a rack, said to have been invented by the Dukes of Exeter and Suffolk during the reign of Henry VI. This curious instrument was for some time preserved in the Tower of London. Blackstone avers that it was never put into use.—*Blackstone*, iv. 326.

**DUKE OF YORK'S SCHOOL** is the popular designation for the *Royal Military Asylum* at Chelsea. In the French army, there have long been *enfans de troupe* borne on the books of each company or battalion of soldiers; that is, children of deceased soldiers, unprovided with other homes. In England, no such system prevails. The late Duke of York, about the year 1800, used his influence to obtain the formation of a soldiers' orphan asylum. Accommodation was obtained at Chelsea; and in 1803, schools were opened for 700 boys and 300 girls, children of deceased soldiers. The institution has been maintained ever since, under certain alterations of plan. The boys are wholly supported as well as educated. They are not bound to serve the state after they leave the asylum; but most of them nevertheless enter the army. A soldier's son has not a *right* of admission; a selection is made according as vacancies may occur. When the boys leave the school, those who do not enter the army are apprenticed to trades. The asylum is under a board of commissioners, who make the necessary rules and regulations. The chief officers are the commandant, secretary, quarter-master, head-master, chaplain, surgeon, and dispenser.

The current expenses are defrayed by an annual parliamentary grant, included in the Army Estimates.

It may here be stated that no provision is now made by the state for the *daughters* of deceased soldiers. The girls admitted into the asylum in the early years of its history, brought discredit to it by their after-life; and this part of the system was abandoned. There is only a private institution, situated near Hampstead, unaided by the state, for receiving soldiers' orphan daughters; it originated during the Crimean war.

**DU'KINFIELD**, a township in the north-east of Cheshire, 42 miles from Chester, and separated from Ashton-under-Line in Lancashire by the river Tame. It has extensive cotton-factories, iron-foundries, fire-brick and tile works, and collieries. Astley's New Pit in this township is the deepest coal-mine in the world, being 690 yards from the surface. Pop. (1861) 29,949.

**DULCI'GNO**, a town and seaport of European Turkey, province of Albania, is situated on the shore of the Adriatic, 15 miles west-south-west of Scutari. The inhabitants were long notorious for piracy, but are now more creditably engaged in the oil and coasting trade. D. is the seat of a Catholic bishop. Pop. about 7000.

**DU'LCIMER**, a musical instrument somewhat resembling a flat box, with sounding-board and bridges, strung with thin wire, and played on by striking the wires with a small piece of wood in each hand.

**DU'LCOSE**, or **DU'LCINE**, is a substance closely allied to manna-sugar or mannite, and imported from Madagascar. It consists of $C_6H_7O_6$, or $C_{12}H_{14}O_{12}$, is insoluble in boiling alcohol, and does not undergo fermentation.

**DULSE** (*Rhodomenia palmata*), a sea-weed, one of the CERAMIACEÆ (q. v.), growing on rocks in the sea, and used as food by the poor on the coasts of Scotland, Ireland, and other northern countries, and of the Grecian Archipelago, occasionally also as a luxury by some of the wealthier classes who have acquired a taste for it. It has a purple, leathery, or somewhat membranous, veinless, sessile frond, irregularly cut, with repeatedly forked segments, which are either entire at the edges, or furnished with lateral leaflets, the spores distributed in cloud-like spots over the whole frond. Its smell somewhat resembles that of violets. It is eaten raw or roasted, and with vinegar. In Iceland, it is sometimes boiled in milk. It is an important plant to the Icelanders, and after being washed and dried, is stored in casks, to be eaten with fish. In Kamtchatka, a fermented liquor is made from it. It is extremely common on all parts of the British coasts. Sheep are fond of it, and seek it eagerly at low water.—The cry 'Dulse and tangle' was once common in Edinburgh.—The name Dulse is also given in the south-west of England to another sea-weed, *Iridæa edulis*, also one of the *Ceramiaceæ*, which has an undivided, obovate or wedge-shaped, flat, expanded frond, very succulent, tapering to a short stalk, and of a dull purple colour. It is occasionally employed as food both in the south-west of England and in Scotland, and is either eaten raw or pinched between hot irons.—PEPPER DULSE (*Laurentia pinnatifida*), another of the *Ceramiaceæ*, has a compressed cartilaginous frond, twice or thrice pinnatifid. It has a pungent taste, and is used as a condiment when other sea-weeds are eaten.

**DU'LWICH**, a suburb of London, in the north-east of Surrey, four and a half miles south-south-east of St Paul's Cathedral, and near Sydenham. Pop. (1861) 1723. It is a fine rural spot, has many genteel residences, and is noted for its college and picture-gallery.

DULWICH COLLEGE, or God's Gift, was founded in 1619 by Edward Alleyne, a tragic actor. The building consists of three sides of a quadrangle, and has attached a manor of 1400 acres. Its revenue in 1860 amounted to £12,000, and it maintains a head-master, several under-masters, a chaplain, six poor brethren, six poor sisters, twelve poor scholars, and thirty out-members. The picture-gallery, of choice old Italian, Flemish, and other paintings, was left to the college in 1811 by Sir F. Bourgeois, and is much visited.

**DUMANGAS**, a town in the province of Iloilo, island of Panay, one of the Philippines. It is situated not far from the sea-coast, near the river Jalaur. The vast plain of D. produces abundance of rice. Pop. of town, 25,000. See Sir J. Bowring's *Visit to the Philippine Islands* (Lond. 1859).

**DUMAS**, ALEXANDRE, a French novelist, is the son of the republican general, Alexandre Davy-Dumas, who was himself the offspring of the Marquis Davy de la Pailleterie and a negress. The crisp hair and thick lips of D. bear testimony to his African origin, a testimony which is confirmed by the savage voluptuousness and barbaric taste of his partial innumerable compositions. D. was born at Villers-Cotterets, 24th July 1803.

His father died when he was quite a child, and he received in consequence a very imperfect education. At the age of twenty, he came to Paris to seek his fortune, and after a short time received an appointment in the household of the Duc d'Orleans. In 1826, he first appeared as an author in a volume of *Nouvelles;* but it was not till 1829, when his historical drama, *Henri III. et sa Cour*, was brought upon the stage, that France fairly mistook him for a genius. This work appeared at the time when *Romanticism* was beginning to triumph over *Classicism* in French poetic literature, and was hailed by the advocates of the former as a crowning victory. The Duc d'Orleans, who was delighted with the production, led the applause, on the first night of its representation, in honour of the author. Next morning, D. was made librarian to his Highness. From this period, he became more and more a noted character in Paris, dexterously contriving at once to feast the appetites of the mob, and to continue the companion of princes. In 1846, he accompanied the Duc de Montpensier to Spain, as the historiographer of his marriage. Afterwards, he visited Africa; and on his return to Paris, finding his income inadequate to meet the expenses of his costly mode of life, he opened a theatre of his own. The revolution induced him to attempt a political career; but France, in spite of its discreditable admiration of this literary Cagliostro, had sufficient good sense to turn the cold shoulder to him. In 1853, 'financial considerations' compelled him to seek refuge in Belgium. Subsequently, his pecuniary star being once more in the ascendant, D. visited the East. After the conquest of Sicily by Garibaldi in 1860, he followed in the wake of the great Liberator, who does not seem, however, to have been imposed upon by his mountebank worship and bombastic enthusiasm.

It would require pages to enumerate all the productions which have been issued under the name of D.; but for two reasons, this is unnecessary: first, they are for the most part worthless, and second, they are for the most part not *his.* M. Alphonse Karr, in his *Mercantilisme Litteraire* (1845), and M. Eugène de Mirecourt, in his *Fabrique de Romans, Maison A. Dumas et C$^{ie}$* (1845), have exposed the astounding quackery of this writer. It would seem that D. has introduced the *sweating-system* into literature, for he has, or rather had, in his employment a large number of poor authors and literary hacks, whose circumstances or position hindered them from demanding a legitimate emolument for their labour. To these persons, D. was in the habit of giving a few brief outlines of a novel or drama, and then paid them for composing the work, which appeared as the production of D.'s miraculous pen. Thus it happened that D. sometimes contrived to issue more volumes in a year than it was possible for a human being to transcribe in the same period. His best known works are *Les Trois Mousquetaires* (8 vols., 1844), *Le Comte de Monte-Cristo* (12 vols., 1841—1845), *La Reine Margot* (6 vols., 1845). His *Mémoires*, commenced in 1852, only confirm the impression of his character which one derives from the perusal of his books. Altogether, it may be said that the appearance in literature of a writer like D. is a portentous phenomenon; and the avidity with which his invariably immoral, and generally licentious fictions are devoured, is the most severe condemnation of modern, and especially French, society that could well be pronounced.—Dumas, Alexandre, or Dumas the Younger, son of the preceding, who has unhappily followed in the footsteps of his father, was born at Paris, 28th July 1824. His principal work is *La Dame aux Camélias* (2 vols., 1848), a novel on which is founded the notorious opera of *La Traviata.* It is perhaps the most audaciously immoral work in existence. The heroine is a prostitute, who, while following her avocation, contrives (in a manner known only to French novelists) to keep up a pure and unsullied affection for a young gentleman, who is a compound of sentimentalism, imbecility, and lust. Among D.'s other works may be mentioned *Le Roman d'une Femme* (1849), *Diane de Lys* (1851), *La Dame aux Perles* (1854), and *La Vie à Vingt Ans* (1856).

**DUMAS**, Jean Baptiste, a distinguished French chemist, was born at Alais, in the department of Gard, in 1800. He was at first apprentice to an apothecary in Geneva, and engaged in some scientific investigations that attracted the attention of Decandolle and Prévost. In 1821, he came to Paris, and was appointed chemical *répétiteur* (tutor) in the Polytechnic School, and then professor of chemistry in the Athenæum. He was afterwards removed to the Sorbonne, and made a member of the Institute. His researches in organic chemistry, on atomic weights, sulphuric ether, and the law of 'substitutions,' attracted attention over all Europe. D. is not merely an expert chemist, but an able and bold thinker, and eloquent expounder, who has the art of making science attractive, and of captivating his hearers. During the July monarchy, he was a member of the Council of Education. After the revolution of February, he was chosen a member of the Legislative Assembly; and from 1849 to 1851, he held the portfolio of Agriculture and Commerce. After the *coup d'état,* he was made a member of the Senate and of the Superior Council of Public Instruction, of which he is at present vice-president. Numerous contributions from his pen are contained in the *Annales de l'Industrie* and other scientific journals, and in the *Mémoires de l'Académie.* His chief work is *Traité de Chimie appliquée aux Arts* (8 vols., Paris, 1828—1845). He has also published *Leçons sur la Philosophie Chimique* (Paris, 1837); *Essai sur la Statique Chimique des Etres Organisés* (Paris, 1841; 2d ed., 1843), &c.

**DUMB.** See Deaf and Dumb.

**DUMB CANE** (*Dieffenbachia seguina*, formerly called *Arum seguinum* and *Caladium seguinum*), a plant of the natural order *Araceæ*, remarkably differing from the plants of that order generally in its almost arborescent character, but agreeing with them in its acridity, which is in none of them more highly developed. It has a cylindrical stem, with ringed scars and oblongo-ovate leaves. It is a native of the West Indies, and has received its English name from the property which it has of producing dumbness when chewed, its acrid poisonous juice causing an immediate swelling of the tongue, accompanied with excruciating pain. The juice is, however, sometimes used to effect the granulation of sugar. A decoction of the stem is used as a bath and fomentation in dropsy, and the root-stock is used in obstinate constipation.

**DUMBA'RTON**, a royal, parliamentary, and municipal burgh, seaport, and chief town of Dumbarton county, is situated on the left bank of the Leven, near its junction with the Clyde, and 15 miles west-north-west of Glasgow. It is well built, and chiefly consists of a long irregular and semicircular street, parallel to the river. The chief branches of industry carried on in the town of D. are ship-building, machine-making, and rope-works, print and bleach works, and salmon-fisheries. It has regular steam-communication with Glasgow, Greenock, and Loch Long. Pop. (1861) 8253. It unites with Kilmarnock, Renfrew, Rutherglen, and Port Glasgow in sending one member to parliament. D. is supposed to have been the Roman station Theodosia, and the capital of the kingdom of the Britons, on the vale of the Clyde. Alexander II., in 1222, made it a royal burgh. To the east of the alluvial plain at the mouth of the Leven stands the famous and picturesque castle of Dumbarton, on a steep, rugged, basaltic rock, rising to the height of 560 feet, a mile in circuit at the base, and forming nearly an island at high water. The rock almost hides the town of D. from the Clyde. The fortress, composed of houses and batteries, studded over the rock, is of considerable historical interest. The rock is accessible only at one part, which is fortified by a rampart. The castle has been often besieged. A huge two-handed sword, said to be that of Wallace, is shewn here. D. gave the title of Earl of Dumbarton to a cadet of the house of Douglas, and commander of a regiment in the royal cause during the troubles in Scotland in the reigns of Charles II. and James II.; the popular song, *Dumbarton's Drums beat bonny, O*, has reference to this personage, who died in exile after the revolution.

**DUMBA'RTONSHIRE** (anciently, Lennox, Levenax, or Leven's Field), a sickle-shaped county in the west of Scotland, bounded E. by Loch Lomond, Stirling, and Lanark; S., by Renfrew and the Clyde estuary; W., by Loch Long and Argyle; and N., by Perth. It is 35 miles long, and 15 (average 7½) broad, with 35 miles of coast; area, 297 square miles. On the east, it has a detached part of 12 square miles, enclosed by Stirling and Lanark. The south coast on the Clyde is mostly low and sandy. Loch Long forms twenty miles of the west border. The Gare Loch, one mile broad and six long, forms, with Loch Long, the Roseneath peninsula in the south-west, studded with beautiful villas. Loch Lomond for 24 miles bounds the east side of the county, the hills rising from a low, narrow, and wooded shore. Here is the romantic scenery of part of Rob Roy's country described by Scott. The north of the county is mountainous or hilly, rising in Ben Voirlich 3300 feet. The scenery of D. is very romantic, and the county forms the route to the West Highlands of Argyle and Perth. The ancient ferry from the Lowlands to the Highlands was between Port Glasgow and Cardross. There are many streams, and nine fresh-water lakes, the largest being Loch Lomond. The chief rivers are the Clyde, along the south border; and the Leven, the outlet of Loch Lomond, and running six miles into the Clyde, at the foot of Dumbarton Rock. The rocks are mica-slate, talc-slate, clay-slate, trap, coal-measures, and carboniferous limestone. The mineral products are coal, freestone, limestone, ironstone, and slates. The climate is mild and humid. The arable lands lie chiefly south of Loch Lomond, and along the Clyde east and west of Dumbarton Castle. On the hills are reared Highland cattle and black-faced sheep, and on the plains Ayrshire cattle and Cheviot sheep. In 1857, a fourth of the county was in crop, the chief crops being oats, turnips, barley, wheat, and potatoes. D. has extensive and valuable woods. The chief branches of industry are the manufactures of cottons and linens, ship-building, bleaching, calico-printing, and dyeing. D. is divided into twelve parishes. Pop. (1861) 52,035. In 1851, D. had 46,995 inhabitants; 75 schools, with 4778 scholars; and 55 churches (16 Established, 15 Free, and 10 United Presbyterian). D. sends one member to parliament. A portion of the Roman Wall of Antoninus runs through the south-east corner of the county, and ends at Kilpatrick. At Luss is the cairn of St Kessock, a martyr in 520. There are remains of Roman forts, and of a Roman bridge at Duntocher. Stone coffins and Roman vases and coins have been found.

**DUMBNESS.** See Deaf and Dumb.

**DU'MDUM**, the name of a town and of a valley in India.—1. The town is well known in the military history of the country, standing in lat. 22° 38′ N., and long. 88° 30′ E. It is ten miles to the south-east of Barrackpore, and eight to the north-east of Calcutta, having extensive accommodations for troops, and a cannon-foundry. The place is famous in connection with the mutiny of 1857, as the scene of the first open manifestation on the part of the sepoys against the greased cartridges.—2. The valley leads into Cashmere from the south, over what is called the Pir Panjal Pass, whose crest is 11,800 feet above the level of the sea. It is about lat. 33° 45′ N., and long. 75° E.

**DUMFRIE'S**, a royal, parliamentary, and municipal burgh, river-port, and county-town of Dumfriesshire, on the left bank of the Nith, nine miles from its mouth in the Solway Firth, 73 miles south-by-west of Edinburgh, and 33 west-north-west of Carlisle. It stands on a rising-ground, surrounded, except towards the sea, by fine undulating hills, many of which are green to the top. It is an irregular but well-built town of red freestone, and is reckoned the capital of the south of Scotland. Two bridges cross the Nith to Maxwelltown, a suburb in Kirkcudbright. One of the bridges is usually stated to have been begun by the mother of John Baliol, king of Scotland; but is in reality a structure of the 17th c.: it had 13 arches, with a central gate; only six arches now remain, and it is limited to foot-passengers. Inigo Jones erected the mid-steeple of the town-house. The very high tides of the Solway Firth bring vessels of sixty tons up to the town, and larger ones to the river quays below the town. D. has two large manufactories of woollen cloths (Tweeds); it also manufactures hats, hosiery, leather, baskets, and wooden shoes. The chief exports are woollen cloths, wool, freestone, hosiery, shoes, sheep, grain, wood, and bark. D. is noted for its markets, livestock being here transferred from Scotch to English dealers. Pop. (1861) 14,024. It unites with Annan, Sanquhar, Lochmaben, and Kirkcudbright, in sending one member to parliament. D. arose in a castle, of which nothing now remains. The early Scotch and English kings had frequent contests for its possession. About 1200, a monastery was founded here, in the chapel of which Comyn (q. v.) was stabbed by Robert Bruce in 1305. The town was often plundered and burned in the border wars. The Highlanders, under Prince Charles, in 1745, fined D. £4000, and plundered and burned it. Burns was for some years an exciseman here, and his tomb in the churchyard is one of the notable objects of the place. In 1860, 1312 vessels, of 75,345 tons, entered and cleared the port.

**DUMFRIE'SSHIRE**, a border county of Scotland, on the Solway Firth, having Kirkcudbright on the west. It forms an irregular ellipse 55 miles by 32, with 22 miles of coast-line on the Solway Firth, to which its surface slopes; area, 1129 square miles. The north half is mountainous, rising in Hart Fell 2635 feet; Lowther Hills, 2522; Black Lark, 2890; Ettrick Pen, 2258; and Queensberry, 2259. The south part is undulating. The country on the Solway Firth (q. v.) for ten miles inland is flat, sandy, and gravelly, with some clay, and tracts of 'cobbles' or large stones. D. is drained principally by three rivers —the Nith, 40 miles long; the Annan, 30; and the Esk, 30; which run south-east and south into the Solway Firth from the north border of the county, and divide it into three districts or dales, called after the rivers. There are many small lochs, some of which contain vendace. D. consists of Silurian, Permian, and Carboniferous strata, with eruptions of trap. Tortoise footprints were found in the new red sandstone of Annandale. The mineral products are coal, limestone, marl, ironstone, lead, and silver. There are extensive lead-mines at Wanlockhead, two miles from Leadhills, in Lanarkshire. Gold was formerly obtained in quartz veins in the hills near Wanlockhead; a mass of five ounces found there is now in the British Museum. There are noted sulphureous springs at Moffat, and chalybeate ones at Hart Fell. The climate is moist and mild, and most of the land has a southern exposure. The soil in the lower parts is a light, gravelly, or sandy loam, or clay. There are rich alluvial tracts along the rivers and on the Solway Firth. The Lochar peat tract, on the Solway Firth, is 13 by 2 to 3 miles, and contains shells, trees, and fragments of ships. The chief occupations are agriculture, and the rearing of cattle, sheep, and pigs. In 1857, nearly a fourth of the county was in crop, the principal crops being oats and turnips. Sheep-farms occupy the hills, of which a third of the county consists. The chief exports are cattle, sheep, grain, freestone, wool, hams, and bacon. There are fisheries of salmon in the rivers, and of cod, cockles, and mussels in the Solway Firth. Two railways cross the county from Carlisle to Edinburgh and Glasgow. Pop. in 1861, 75,877. In 1851, D. had 78,123 inhabitants; 176 schools, with 11,349 scholars; 92 churches (36 being Established, 20 Free, and 20 United Presbyterian). The chief towns are Dumfries, Annan, Sanquhar, Lochmaben, and Moffat. D. sends one member to parliament. A third of the county belongs to the Duke of Buccleuch. There are numerous antiquities in various parts of the county. D. formed part of Valentia in Roman times. It afterwards belonged to the Saxon Northumbrian kings.

**DUMMOW′**, a town in the territory of Saugor and Nerbudda, stands in lat. 23° 50′ N., and long. 79° 30′ E., being 775 miles to the westward of Calcutta. It has a large bazaar, and is abundantly provided with wells. Its district, a pergunnah of the same name, contains 1,554,058 acres, and 363,584 inhabitants.

**DUMONT**, Pierre Etienne Louis, an able propagator of the Benthamite philosophy, was born at Geneva, 18th July 1759, studied theology, and after officiating as a minister for a short time in his native town, proceeded to St Petersburg in 1783, where he accepted the charge of the French Protestant Church. In 1785, he left Russia, went to England, and became tutor to the sons of Lord Shelburne, afterwards Marquis of Lansdowne. His superior talents, liberal sentiments, and fine character, soon recommended him to the illustrious Whigs of that period; with Sir Samuel Romilly, in particular, he formed a close friendship. During the early years of the French Revolution, D. was at Paris, where he became greatly attached to Mirabeau, regarding whom he has given the world much important information in his *Souvenirs sur Mirabeau et sur les deux Premières Assemblées Législatives* (which were not published till 1832, seven years after the author's death). From this work, it appears that D. wrote many of the best articles and speeches attributed to Mirabeau. In 1791, D. returned to England, and formed an intimacy with Bentham. This was certainly the most important event in his life. Deeply convinced of the value of that philosopher's views of legislation, he requested his friend to allow him to arrange and edit his unpublished writings on this subject. Bentham gave him his manuscripts. D. laboured earnestly to abridge, elucidate, correct, and simplify what he had received. The results appeared in his *Traité de Législation Civile et Penale* (Geneva, 1802), *Théorie des Peines et des Récompenses* (Geneva, 1810), *Tactique des Assemblées Législatives* (Geneva, 1815), *Preuves Judiciaires* (Geneva, 1823), and the *Organisation Judiciaire et Codification* (1828, a posthumous work). D. returned to Geneva in 1814, and became a member of the representative council. In this office he found many opportunities of putting the principles of Bentham into practice, and thus greatly benefited his native city. He died in 1825, at Milan.

**DUMOURIEZ**, Charles François, a French general, was born at Cambrai, 25th January 1739, entered the army in 1757, and served in Germany during the Seven Years' War. On the conclusion of hostilities in 1763, D., who possessed a restless, adventurous genius, went from one country to another, seeking active employment. Under Louis XVI., he held the office of commandant of Cherbourg, where he commenced the formation of a great naval establishment. As the Revolution drew on, D. began to attach himself more closely to the popular party. In 1790, he became connected with the Jacobin Club, and during the same year was appointed military commandant of Lower Normandy. After holding for a short time the office of Minister of Foreign Affairs, he became Lieutenant-general in the army of the North, commanded by Maréchal Luckner. The allies were advancing in great force. By a series of bold and rapid manœuvres, D. prevented his enemies from sweeping over the plains of Champagne, and finally took up his position at Grand-Pré. Succours quickly arrived, and the victory of Kellermann at Valmy compelled the invaders to retreat. It is generally admitted that by his admirable strategic movements at this critical period D. saved France. A winter campaign in Belgium followed, and on the 5th and 6th November 1792, D. overthrew the Austrians under the Duke of Sachsen-Teschen and Clairfait at Jemappes. The campaign of 1793, which aimed at the complete conquest of the Netherlands, was opened with the siege of Maestricht; Breda and other places were taken by the French; but at Neerwinde, D. sustained a severe defeat from the Austrians under Coburg. D.'s Jacobinism had been cooling for some time, on account of the anarchy prevailing at Paris, and when commissioners were sent to remonstrate with him on account of his monarchical leanings, he told them nothing could save France from the horrors of anarchy but a constitutional monarchy; D. then entered into secret negotiations with Coburg, evacuated Belgium, and promised to exert himself on behalf of the Bourbon family. He was now accused of being a traitor, by the authorities at Paris; but when requested by the commissioners to proceed to the capital, and stand his trial, he answered by handing over the representatives of the people to the Austrians. He next endeavoured, but in vain, to win the army over to his plan of marching upon Paris, and re-establishing the royal authority, and D. had to take refuge, accompanied by the Duc de Chartes, in the ranks of the enemies of France. The Convention set a price of 300,000 francs upon his head. After wandering through many countries of Europe, he finally settled in England, where he died an exile at Turville Park, near Henley-upon-Thames, 14th March 1823. Besides a multitude of pamphlets, D. has written *Mémoires du Général Dumouriez* (Hamburg, 1796), and *La Vie et les Mémoires du Général Dumouriez* (3d edit., Paris, 1822—1824).

**DUN**, a root common to the Celtic and Gothic languages, signifying a hill or height. Besides giving rise to the Fr. *dunes*, Ger. *dünen*, Eng. *downs* (q. v.), it enters extensively into the names of places (becoming often *dum*, *don*), as *Dun*kirk, *Dum*barton, *Don*egal. It is allied to the Ang.-Sax. *tun*, *ton*, whence *town* (q. v.).

**DÜ'NA, DWI'NA**, or **DVI'NA**, the name of a river of Russia, which rises in the government of Tver, in the neighbourhood of the source of the Volga, and flows west-south-west in a course almost parallel to that of the Dnieper. At Vitebsk, the D. turns to the west, then to the north-west, and advances in that direction toward its debouchure in the Gulf of Riga, passing the towns of Disna, Drissa, Dünaburg, Jacobstadt, and Riga. The entire length of the D. is about 650 miles. It is navigable from Dünamunde, at its mouth, to Velij, on the border of the government of Smolensk—a distance of 400 miles; but the navigation, owing to its shallows, its rock-obstructions, and sand-banks, is extremely difficult and dangerous, except during the spring and autumn floods. The basin of the D. is estimated at 28,350 square miles; at Riga, its breadth is 2400 feet. In the spring, the surface of the D. is covered with rafts and planks, which are floated down from the forests of the provinces through which it flows. Its waters, which abound in fish, are connected with those of the Dnieper by means of the Beresina Canal, and there is thus a water-communication between the Black Sea and the Baltic.

**DÜ'NABURG**, a strongly fortified town of Western Russia, is situated on the Düna, in lat. 55° 53′ N., long. 26° 24′ E. It is of great military importance, owing to the strength of its fortifications. It has three fairs in the course of the year, and considerable trade. Pop. (1855) 11,511. D. was formerly the capital of Polish Livonia.

**DUNBA'R**, a royal, parliamentary, and municipal burgh, and very ancient seaport and town in the north-east of Haddingtonshire, on an eminence at the mouth of the Firth of Forth, 29 miles east-north-east of Edinburgh. The coast near D. consists of basaltic rocks and islets, and gives fine views of the Bass Rock, the Isle of May, and Fifeshire. D. is a fine old town with broad streets. It has a sailcloth and cordage manufactory, and extensive tile-work, breweries, &c., but the chief industry is the fisheries, in connection with which there are large curing establishments. The old harbour is impeded at the entrance by craggy islets and sunken rocks, but is accessible to vessels of 300 tons. About the year 1840, an additional harbour, called the Victoria Harbour, was erected at D., at the expense of the Fishery Board and town; with recent important repairs and improvements, it has cost altogether upwards of £50,000. It has four feet at low water, and is considered one of the best suited for fishery purposes in the country. From 4000 to 5000 tons of herrings are annually exported from D., besides what are used for local consumption. The other exports are chiefly corn and potatoes. Pop. (1861) 3791. D. unites with North Berwick, Jedburgh, Haddington, and Lauder in sending a member to parliament. On the high rocks at the entrance to the new harbour are a few fragments of the ruins of a castle, which, from the end of the 11th c., was the chief seat of the ancient Earls of March. It was once very strong, and an important security against English invasions: Edward I. took it, and Edward II. fled thither after the battle of Bannockburn; it was demolished in 1333, and rebuilt in 1336; it was successfully defended in a siege of six weeks against the Earl of Salisbury by Black Agnes, Countess of Dunbar, in 1338; it sheltered Queen Mary and Bothwell in 1567; and in the same year it was destroyed by the Regent Murray. In 1650, Cromwell, at the 'Race of Dunbar,' defeated the Scottish army under Leslie.

**DUNBAR, William**, the greatest of the old Scottish poets, is supposed to have been born about 1460. In 1475, he went to St Andrews, where, in 1477, he took the degree of B.A., and in 1479 that of M.A. Considerable obscurity rests upon his career for about twenty years after he left the university. From his own writings, we learn that he entered the order of St Francis, and was employed for some time as an itinerant or preaching friar. In that capacity, he 'ascended the pulpit at Dernton and Canterbury, and crossed the sea at Dover, and instructed the inhabitants of Picardy.' He appears to have entered the king's service, and to have been retained as 'clerk' or secretary to some of James's numerous embassies to foreign courts. In 1500, he obtained from the king a yearly pension of £10. In 1501, he visited England, in the train, as his biographers suppose, of the ambassadors sent thither to conclude the negotiations for the king's marriage. On the 9th May 1503, three months before the queen's arrival, he composed in honour of the event his most famous poem, the *Thrissil and the Rois.* He seems now to have lived chiefly about court, writing poems, and sustaining himself with hope of preferment in the church. On the 17th March 1504, he received a gift for saying mass for the first time in the royal presence. At Martinmas 1507, his pension was doubled, and three years afterwards, it again received augmentation. He is supposed to have visited the northern parts of Scotland in May 1511, in the train of Queen Margaret. After the ruinous defeat at Flodden, and the confusion consequent on the king's death and a prolonged regency, D.'s name disappears altogether. He is supposed to have died about 1520.

As a poet, he possessed a wonderful variety of gifts; his genius comprised the excellences of many masters. He is at times as rich in fancy and colour as Spenser in the *Faery Queen;* as homely, and shrewd, and coarse as Chaucer in the *Miller's Tale;* as pious and devotional as Cowper in his *Hymns;* and as wildly grotesque in satire as Burns in his *Death and Doctor Hornbook.* When Scott read portions of his works to Crabbe, in Edinburgh, the latter remarked that, 'before the Ayrshire ploughman, Scotland possessed at least one great poet.' A complete and carefully elaborated edition of D.'s works, by Mr David Laing, was published at Edinburgh in 1834.

**DUNBLA'NE**, a city and burgh of barony in the south of Perthshire, picturesquely situated on the left bank of the Allan, on the Scottish Central Railway, 28 miles south-west of Perth, and 5 north of Stirling. It takes its name from St Blane, a bishop of the 7th or 8th c., said to have been born in Bute. It mainly consists of one street of old-fashioned houses. Pop. (1861) 1709. The cathedral of Dunblane, chiefly in the First-pointed or Early English style, about the year 1240, is now in ruins, except the choir, used as the parish church, 80 by 30 feet, with a tower 128 feet high, the first four stages of which are Romanesque work of about the year 1140. The prebendary stalls of richly carved oak still remain. Of the bishops of Dunblane, by far the most celebrated was Robert Leighton, who held the see from 1661 till 1672, when he was translated to Glasgow. A path near the river, which he is said to have frequented, still bears the name of 'The Bishop's Walk;' and the library which he bequeathed to his diocese, is still kept in the town. Two miles from D. was fought, in 1715, the indecisive battle of Sheriffmuir, between the royal forces, under the Duke of Argyle, and the troops of the Pretender, under the Earl of Mar. D. once had an ancient Culdee monastery.

**DUNCAN, Adam, Viscount**, a celebrated British admiral, was born in 1731 at Dundee, entered the navy as midshipman in 1746, became lieutenant in 1755, and in 1761, commander of the *Valiant*, of 74 guns, which took part in the expedition to Havanna under Admiral Keppel. In 1789, he was appointed Rear-admiral of the Blue, and in 1793, Vice-admiral of the Blue, but had little opportunity of distinguishing himself, and was even meditating, it is said, retiring altogether from the service, when he was appointed to the command of the united English and Russian squadron in the North Sea, with the special design of watching the movements of the Dutch fleet—Holland and France being then both at war with England. D.'s blockade of the Texel was one of the most effective ever made, and the Dutch trade was almost ruined. During the blockade, a mutiny took place among the seamen, and D.'s position was for some time very critical, but the insubordination was ultimately quelled. Although weakened by the recall of the Russians, he gained a brilliant victory over the Dutch near Camperdown, 11th October 1797, where he took the Dutch admiral, De Winter, prisoner. D. was rewarded with a pension of £2000, and raised to the peerage, with the title of Viscount. In 1799, he was promoted to the rank of Admiral of the White, and died 4th August 1804, after having inherited the family estates in Perthshire, on the death of his brother.

**DUNCAN, Thomas, R.S.A., and A.R.A.**, was born at Kinclaven, Perthshire, May 24, 1807; and died at Edinburgh, 25th May 1845. He studied in the Trustees' Academy, under Sir William Allan; was his successor as head-master of that school, and one of the most distinguished members of the Royal Scottish Academy. His portraits, and historical and fancy subjects, evince delicate feeling for female beauty, and keen appreciation of the humorous in Scottish character. The drawing is always careful and correct, and the colouring remarkable for clearness and delicacy. Though he exhibited but few pictures in the Royal Academy of London, they at once attracted marked attention, and he was elected an Associate of that body in 1843. The principal works he exhibited there were: 'Anne Page and Slender;' an illustration from the ballad of *Auld Robin Gray*, now in the Sheepshanks Gallery, South Kensington; 'Prince Charles's Entry into Edinburgh after the Battle of Prestonpans'—and the same Prince, when a fugitive, concealed in a cave. He had now entered on a most successful career, and was engaged on the studies for two important works: 'Wishart Dispensing the Sacrament on the Day of his Martyrdom;' and a large picture for the Marquis of Breadalbane, 'Queen Victoria at Taymouth,' when he was seized with an illness which terminated fatally. One of his latest works was a portrait of himself; it is now in the National Gallery of Scotland, and is an excellent specimen of careful drawing, united to great power of colour and effect. That D. was remarkable for energy and industry, is proved by the number and high quality of the works he executed, though he died at the early age of thirty-eight. His portraits, especially those of ladies and children, will always hold a high place. Though constantly engaged on fancy subjects, he every year exhibited a very considerable number of portraits. In addition to the works above referred to, the following is a list of the principal historical and fancy subjects exhibited by him in the Royal Scottish Academy—1829: 'The Death of Old Mortality,' and 'A Milkgirl.' 1830: 'The Braw Wooer,' and 'Children and Rabbit.' 1831: 'Lucy Ashton,' and finished sketch of 'Jeanie Deans and the Robbers.' 1832: 'Girl with Flowers.' 1834: 'Cuddie Headrig Visiting Jenny Dennison.' 1835: 'Mary Queen of Scots compelled to Sign her Abdication.' 1836: 'A Covenanter,' and 'Old Mortality Renewing the Inscription on a Tombstone.' 1838: 'The Secret Chamber—Isaac of York Visiting his Treasure,' 'The Lily of St Leonards,' and 'The Friends.' 1839: Study of 'A Highland Stag, with Dead Game and Fruit.' 1845: 'The Martyrdom of John Brown of Priesthill, 1685.' 1846: The finished sketch of 'Wishart Dispensing the Sacrament on the Day of his Martyrdom, March 1, 1546,' was exhibited after the artist's death.

**DU'NCANSBY HEAD** (the *Berubium* of Ptolemy), a promontory forming the north-east extremity of Caithness, in lat. 58° 39′ N., and long. 3° 1′ W., and one mile and a half east of John o' Groat's House. In the vicinity are deep long chasms or *ghoes*, in the Devonian strata, and curious detached sandstone columns in the sea called *stacks*. One of the chasms is 300 yards long, 12 to 15 wide, and 100 feet deep, and communicates with the sea by three openings, one of which is arched. The horizontal beds of the sides of the perpendicular gullies look like ruined walls.

**DU'NCIAD, The**, by Alexander Pope, was published in 1728, in three books; and to these, in 1742, a fourth book was added. Pope had been, during the greater part of his career, afflicted by a host of critics and detractors. His own genius had not been spared; the worst motives, personal and literary, had been imputed to him; and he resolved to mete unto his enemies the measure which had been meted unto himself. Hence the origin of *The Dunciad.* Never was chastisement more complete. On its publication, a universal howl of rage and pain arose. The satire conferred immortality on his opponents. Pope was a good hater, and his hatred and contempt defy the tooth of Time more completely than all the balsams of the Pharaohs.

**DU'NCOMBE, Thomas Slingsby**, an English politician, nephew of first Lord Feversham, was born 1796. He was elected M.P. for Hertford in 1824, assisted in carrying the Reform Bill, and became a prominent member of the extreme Liberal party. In 1832, he was rejected at Hertford; but in 1834 he was returned for Finsbury, which seat he retained in the parliament which assembled in 1859. In 1842, he presented the Chartist petition, signed by 3,000,000 of the lower classes in favour of universal suffrage, vote by ballot, short parliaments, &c. In 1842, the then Home Secretary, Sir James Graham, having sanctioned the opening of the letters of Mazzini, D. stood up in the House of Commons and denounced, with bitter and scathing invective, the adoption of the post-office spy-system on English soil. He was an earnest advocate of Jewish emancipation; and his motion in 1858 for placing Baron Lionel Rothschild on a committee of the House of Commons, which was to hold a conference with the House of Lords, was soon followed by the concession, by the latter chamber, of the right of Jewish members to sit in the House of Commons.

**DUNDA'LK**, a parliamentary and municipal burgh and seaport, the capital of the county of Louth, Ireland, is beautifully situated at the mouth of the Castleton, on a flat at the head of Dundalk Bay, 50 miles north of Dublin. It is backed on the north-east by the Mourne Mountains, 2000 feet high. Vessels drawing 16 feet can enter the harbour. D. has manufactures of tobacco, soap, leather, pins, starch, and salt; steam flour-mills; important fisheries; distilleries, and flax-spinning-mills. The chief exports, especially to Liverpool, are timber, coal, iron, slates, flax, linen, and all sorts of agricultural and dairy products and livestock. D. is the chief outlet for the produce of the counties of Louth, Monaghan, and Cavan. Pop. (1861) 10,075. It sends one member to parliament. It has the remains of a Franciscan friary and a Druid's circle. The last king of all Ireland was crowned and resided here. Edward Bruce took D. in 1315, and crowned himself and held his court here till killed in battle by the English in the vicinity in 1318. D. was captured by the Irish in 1641, by Cromwell in 1649, and by Schomberg in 1689.—Dundalk Bay is a shallow inlet of the Irish Sea, in the east of Louth county, eight miles broad by seven deep, and with four to six fathoms water in the middle. It contains oyster beds, and receives the rivers Fane, Dee, and Castleton. In 1860, 1167 vessels, of 232,923 tons, entered and cleared the port.

**DUNDA'S**, a term of various application, indicates a castle and manor, a town, an island, a group, a river, and a strait.—1. The castle and manor, from which all the others take name, are on the south bank of the Firth of Forth, near south Queensferry; the castle is a square tower of the 15th c., with modern additions; the manor was the original seat of the distinguished family of Dundas, to whose progenitor it was granted by the Earl of March about the year 1150.—2. The town is in Upper or West Canada, being at the head of Burlington Bay, at the western extremity of Lake Ontario.—3. The island, which belongs to Great Britain, is situated on the north-west coast of America, 40 miles north-east of Queen Charlotte Island. It has Dixon's Entrance (q. v.) on the west, and is separated by Chatham Sound from the most southerly of the Russian islands.—4. The group lies off the east coast of Africa, being about lat. 1° S. It comprises nearly 500 islets, all of coralline formation. There is only one secure harbour. —5. The river is a tributary of Delagoa Bay (q. v.). —6. The strait, in North Australia, separates Melville Island from Coburg Peninsula, being 18 miles across.

**DUNDAS** (of Arniston), the name of a Scottish family singularly distinguished for legal and political talent. Sir James Dundas, the first of Arniston, received the honour of knighthood from James VI., and was governor of Berwick. His son, Sir James Dundas, was appointed a judge of the Court of Session in 1662, and took his seat on the bench under the title of Lord Arniston, but was soon after deprived of his office for refusing to abjure the 'National and Solemn League and Covenant.' He died in 1679. His eldest son, Sir Robert Dundas, who also rose to the bench, died in 1727.—Dundas, Robert, the son of the preceding, was born 9th December 1685; became a member of the Faculty of Advocates in 1709; and in 1717 was appointed Solicitor-general for Scotland, an office which he filled with great ability in a period of much political confusion. In 1720 he was made Lord Advocate; and in 1722 was chosen to represent the county of Edinburgh in the British parliament, where he honourably distinguished himself by his attention to Scottish affairs. When Sir Robert Walpole came into power in 1725, D. resigned his office, when he was elected Dean of the Faculty of Advocates. In 1737, he was raised to the bench, when, like his father and grandfather, he took the title of Lord Arniston. On the death of Lord President Forbes of Culloden, in 1748, he was appointed his successor. He died in 1753. As an advocate, D. was a powerful and ingenious reasoner, and though somewhat disliked on the bench, his ability was universally admitted.—Dundas, Robert, the eldest son of the preceding, was born 18th July 1713, studied at Edinburgh and Utrecht, was admitted to the Scottish bar in 1738, and rose to be Lord Advocate (1754) and President of the Court of Session (1760). D. died at Edinburgh, 13th December 1787.

**DUNDAS**, the Right Honourable Henry, Viscount Melville, and Baron Dunira, brother of the preceding, was born in 1741, and educated at the university of Edinburgh. He was admitted a member of the Scottish bar in 1763. As a younger son of a pretty numerous family, his circumstances were rather straitened; but his assiduity, his large share of the family talent, and no doubt of the family influence, soon procured him advancement in his profession. He was successively appointed Depute-advocate and Solicitor-general. In 1774, he was returned to parliament for the county of Edinburgh, and in the following year was appointed Lord Advocate for Scotland. Two years after, he was made keeper of the King's Signet for Scotland. D.'s career in parliament was highly successful, though not very creditable to his political consistency. Elected in opposition to ministerial influence, he soon allied himself with the party in power, and became a strenuous supporter of Lord North's administration, being one of the most obstinate defenders of the war with the American colonists. When Lord North resigned in 1781, D. continued to hold the office of Lord Advocate under the Rockingham ministry. On the question of the war with America, D. had been opposed to Pitt; but when the Coalition Ministry was formed by Fox and Lord North, he passed over to the side of his old opponent, and became Pitt's ablest coadjutor. When Pitt returned to the helm of the state in 1784, D. was appointed President of the Board of Control. In 1784 he introduced a bill for restoring the estates in Scotland forfeited on account of the rebellion of 1745. In 1791, he was appointed principal Secretary of State for the Home Department. He also held a great number of other offices, one of which, the treasurership of the navy, involved him some years after in much trouble. D.'s aptitude for business was undeniable. Many of the most important public measures originated with, or were directly promoted by him. Among such were the formation of the fencible regiments, the supplementary militia, the volunteer corps, and the provisional cavalry; in short, the whole of that domestic military force raised during the war consequent on the French Revolution. When Pitt resigned in 1801, D. did the same. In 1802, under the administration of Mr Addington, he was elevated to the peerage by the titles of Viscount Melville and Baron Dunira. In 1805, his lordship was accused of 'gross malversation and breach of duty,' while acting as treasurer of the navy. The trial commenced 29th April 1806; but in spite of the splendid array of Whig talent against him, D. was acquitted on all the charges. After this, however, he took little part in public affairs, spending the most of his time in retirement in Scotland. He died at Edinburgh, 27th May 1811.

**DUNDEE'** (Lat. *Taodunum*, the 'hill or fort on the Tay'), a royal parliamentary and municipal burgh and seaport, in the south of Forfarshire, on the left bank of the estuary of the Tay, here two miles broad, 10 miles from the entrance of that river into the sea, 50 miles north-north-east of Edinburgh, 20 east-north-east of Perth, and 14 south-east of Forfar. In population, it is the third town in Scotland.

It stands mostly on the slope between Dundee Law (525 feet high, composed of trap, and with traces of ancient vitrification) and Balgay Hill and the Tay. The streets are mostly narrow and irregular. The Royal Exchange, built in the Flemish pointed style of the 15th c., at a cost of upwards of £12,000, and opened in 1856; the Corn Exchange, capable of containing 2000 people; the Infirmary; St Paul's Episcopal Church, with a tower and spire 217 feet high; the old tower or steeple of St Mary's parish church, 156 feet high—are the most striking architectural features of the town. D. has several public parks, one of which, the Baxter Park, on a beautiful slope to the eastward of the town, is 37 acres in extent. A handsome Post-office and County Buildings are now (1861) being erected. D. is the chief seat in Great Britain of the manufacture of coarse linen fabrics (osnaburgs, sheetings, ducks, dowlas, drills, canvas, and cordage). Manufactures of jute are almost exclusively carried on here. The consumption in D. of this material, which is grown in India, amounts nearly to 40,000 tons annually. The raw material costs in D. a little over 2*d.* per lb.; and the cloth made from it, reckoned by weight, is the cheapest textile fabric made in Great Britain. Of jute many varieties of fabric are made, from the coarsest nail-bagging to carpets of great beauty. This range includes packsheets for every species of merchandise, sacks for wool, coffee, guano, &c. The annual value of the flax, hemp, and jute manufactures in D. is upwards of £3,000,000. D. is also famous for its manufacture of confectionary, which is exported to all parts of the world. One firm uses 150 tons of bitter oranges annually in the manufacture of marmalade. Ship-building and machine-making are carried on to some extent. D. has magnificent harbours, in addition to the tide harbour. Its wet docks cover 33 acres. The new dock will admit vessels drawing, at spring-tides, 25 feet; and at neap-tides, 19 feet. There are also a very extensive dry dock and patent slip for repairing ships, and six commodious ship-building yards. The docks have been erected at a cost of £600,000. At the north end of the mid quay stands the Royal Arch, raised at a cost of £2500, in commemoration of Her Majesty's landing here in 1844. D. is well supplied with water from Monikie, 10 miles distant. Pop. (1861) 90,425. D. sends one member to parliament. It was an important place in the 12th century. Edward I. was here in 1296 and 1303. Wallace is said to have taken the castle in 1297, and Bruce demolished it in 1313. The Duke of Lancaster burned D. in 1385, and the Marquis of Montrose pillaged it in 1645. Charles II. lived here, after his coronation at Scone, in 1650. On the refusal of D. to submit to Cromwell, General Monk, in 1651, sacked and burned it, massacring 1000 citizens and soldiers, and filling 60 vessels with booty, which were totally wrecked on their voyage to England. D. was one of the first Scotch towns which publicly renounced Romanism at the Reformation. Wishart the martyr preached here during the plague of 1544, from the Cowgate arch, now the only relic of the old walls. In 1860, 3130 vessels, of 396,919 tons, entered and cleared the port.

**DUNDO'NALD**, THOMAS COCHRANE, EARL OF, son of the ninth Earl of Dundonald, was born December 14, 1775. His education was scanty, his father having so completely wasted his means in scientific research that he could not afford to pay for his son's schooling, while his pride would not allow him to accept the offer of his parish minister to teach the lad gratuitously. The young Lord Cochrane (under which name his great naval exploits were performed) was destined for the army, and while still a boy, obtained a commission in the 104th Regiment. At the age of 17, however, he joined the *Hind* corvette, commanded by his uncle, Captain Sir Alexander Cochrane, and began the career in which he was destined to win so much renown. In 1795, as acting lieutenant of the *Thetis*, he assisted in the capture, on the coast of North America, of two of a French squadron of five sail. In 1800, he became master and commander of the *Speedy* sloop-of-war, of 14 guns and 54 men; and in ten months he took 33 vessels, carrying together 128 guns and 533 men, besides assisting in the capture of many others. D. received his post-rank, 1801, for the capture, by boarding, of *El Gamo*, a Spanish frigate of 32 guns, off Barcelona. In the same year the little *Speedy* was herself captured by the French squadron under Linois, on which occasion his sword was returned to him, with the request that he would continue to wear what he had so nobly used. On his exchange, he returned to England, and went on half-pay. In 1803, he was appointed to the *Arab*, 22, and served at the blockade of Boulogne. In 1804, he removed to the *Pallas* frigate, 32, and was sent out to assist his uncle, then employed in the blockade of Ferrol. He made several valuable prizes while cruising off the Spanish coast, among others the *Fortuna*, with specie to the amount of £150,000, besides merchandise, but generously returned 10,000 crowns to the Spanish captain and supercargo. In 1806, he cut out the *Tapageuse* corvette, which lay in the Gironde, under the protection of two heavy batteries. He destroyed the semaphores along the French coast, and carried by storm the battery at Pointe l'Equilon, which he blew up. Being now transferred to *L'Impérieuse*, he took and destroyed, in the month ending January 7, 1807, 15 of the enemy's ships, chiefly laden with wine and provisions. He was next sent to co-operate with the patriots on the coast of Catalonia, and contributed to the surrender of the castle of Mongat. After harassing the French coast, and destroying the semaphores on the coast of Languedoc, he volunteered for the defence of Fort Trinidad, at Rosas, on the coast of Catalonia. At the head of 80 of his own men, and the same number of Spaniards, he repelled 1000 of the enemy in an assault made by them upon the castle. He protracted the siege for 12 days, then blew up the magazine, and returned to his ship. In April 1809, he was selected by the Admiralty for the daring and hazardous service of burning the French fleet then lying at anchor, and blockaded by Lord Gambier, in the Basque Roads. At night he went on board one of the fireships, containing 1500 barrels of gunpowder, and performed the service intrusted to him with characteristic intrepidity. He was rewarded with the knighthood of the Bath. He had been chosen M.P. for Westminster in 1807; and his charges of incompetency against Lord Gambier led to a court-martial upon that nobleman. Lord Gambier, after a partial trial, was acquitted, and the professional prospects of his assailant were ruined. During the rest of the war, the country lost the incalculable benefit of his services at sea, the navy gaining, on the other hand, such small advantage as could in those days be derived from D.'s protests in parliament against naval abuses. Early in 1814, he was accused of complicity in fraudulent stock-jobbing transactions. A rumour of the downfall of Napoleon having caused a sudden rise in the funds, D. and his friends were charged with having fraudulently propagated the rumour, and with having 'sold out' to a large amount. He was found guilty of fraud, and was sentenced to pay a fine of £1000, to suffer a year's imprisonment, and to stand in the pillory. The latter part of the punishment was remitted, but he was deprived of the order of the Bath, of his rank in the navy, and expelled from the House of Commons. A new writ was issued for Westminster; but his constituents immediately re-elected him, notwithstanding his expulsion from the House; and his daring was shewn by his escape from prison, and his re-appearance in the House. He represented Westminster until 1818, when, panting for a more active and eventful career, he drew his sword in defence of the independence of the South American colonies of Spain. The command of the fleet of the republic of Chili was offered to him, and the terror of his name materially contributed to the success of the national cause. Valdivia, the last stronghold of the Spaniards, was captured by him. Another daring exploit was the cutting out of a large 40-gun frigate from under the guns of the castle of Callao, 5th November 1820. The Emperor of Brazil, Dom Pedro, afterwards gave him the command of the Brazilian fleet, and created him a marquis. In 1827 and 1828, he assisted in the Greek war of independence. In 1830, the Whig administration of Earl Grey came into office, and, believing him to have been the victim of a cruel and unjust persecution, hastened to restore him to his naval rank. In 1831, he succeeded to the earldom. In 1847, Queen Victoria conferred on him the Grand Cross of the Bath. He was also appointed commander-in-chief on the North American and West India station. In 1851, he was Vice-admiral of the White, and in 1854, Rear-admiral of the United Kingdom, a distinction which he held until his death. On his retirement from active service, he devoted himself to scientific inventions. He made improvements in poop and signal lights, and especially turned his attention to naval projectiles. He declared himself to be in possession of a means of annihilating an enemy's fleet, and during the Russian war offered to destroy Sebastopol in a few hours with perfect security to the assailants. His plans were, however, rejected. When upwards of 80 years of age, he published his Autobiography—the record of a career almost unequalled even by British seamen for desperate service and dauntless exploit. He died October 31, 1860, and was interred in Westminster Abbey. In his naval expeditions, it was his fate to be constantly opposed to forces greatly superior to his own in numbers and metal. His inventiveness and fertility of resource under such circumstances have perhaps never been equalled. His daring would have been, in a man of less genius, the height of rashness, yet the almost unvarying success of his manœuvres and exploits attests his forethought, and his happy adaptation of slender means to the achievement of great ends and noble enterprises. In person, he was tall and broad built; and a slight stoop, contracted by service in the small sloops and corvettes of his early days, scarcely impaired a height of stature that might be described as commanding. His features were Scottish in character, and strongly marked, bearing in deep lines the traces of struggle, sorrow, and the wear and tear of an unusually long, active, and eventful life. His life at sea was a constant romance, and the story of his ubiquitous and incessant actions against the enemy will remain the wonder and delight of sailors of every age and nation.

**DU'NDRUM BAY**, an inlet of the Irish Sea, on the east coast of Ireland, in the county of Down, 5 miles to the south of Downpatrick, is about 10 miles wide at its entrance, and forms a long curve into the shore, with a uniform breadth of about 2½ miles. Here, in 1846, the steam-ship *Great Britain* was stranded, but was got off in the following year without having suffered any very serious damage.

**DUNE'DIN**, the capital of the province of Otago, in New Zealand, a colony situated in lat. 45° 50′ S., long. 170° 36′ E., on the east side of the Middle Isle, towards its southern extremity. It appears to be, with the comparatively insignificant exception of Invercargill, the only seaport of its own section of the colony. Since its foundation in 1848, the place has rapidly increased in importance and prosperity. In 1859, the foreign trade was represented by 54 vessels and 16,606 tons inwards, and by 52 vessels and 16,119 tons outwards. During the same year, the imports and the exports were valued respectively at £218,845 and £81,578. Under the latter head, the principal articles were grain, potatoes, and wool. Among the staple products, the wool alone was worth nearly thrice as much as all the others taken together, yielding £57,925 out of the above stated amount of £81,578. The extension of this branch of traffic has been truly marvellous. Between 1853 and 1859, the quantity rose from 5000 pounds to 900,000, so that, in six years, the proportion had become as 180 to 1. With respect to population, the official returns do not sufficiently distinguish D. from its district. But, in the whole of Otago, the white inhabitants of 1859 were estimated at 9010; while in 1850 they had been only 1149. At the latest moment, the official returns for one year more have come to hand, shewing, in almost every particular, a very considerable improvement. In 1860 the foreign trade was represented by 69 vessels and 24,721 tons inwards and by 60 vessels and 23,488 tons outwards—the superiority over the immediately preceding year bearing more largely on the size of the ships than even on their number. In 1860, again, the imports and the exports were valued respectively at £288,483 and £51,181—the diminution under the latter head comprising a decrease in wool from 900,000 lbs. to 654,270. Finally, in the course of the intermediate year, the population of Otago—meaning that only of European origin—had risen from 9010 to 12,691, or at the rate of fully 40 per cent.

**DUNES**, from the same root as Dun (q. v.), a hill, the name given to the sand-hills or mounds which stretch less or more along the sea-coast of the Netherlands and north of France. These dunes are a natural curiosity. 'As if anxious to save the low countries from tidal inundation, Nature has for centuries been energetically working to increase the magnitude of the mounds on the coast. At low water, when the beach is exposed to the action of the winds from the German Ocean, clouds of sand are raised into the air, and showered down upon the country for at least a mile inland; and this constantly going on, the result is, that along the whole line, from Haarlem to about Dunkirk or Calais, the coast consists of sandy mounds of great breadth, partially covered with grass and heath, but unfit for pasturage or any other purpose, and these are the bulwarks which protect the coast. In some places, these dunes look like a series of irregular hills; and when seen from the tops of the steeples, they are so huge as to shut out the view of the sea. The traveller, in visiting them from the fertile plains, all at once ascends into a region of desert barrenness. He walks on and on for miles in a wilderness such as might be expected to be seen in Africa, and at last emerges on the sea-shore, where the mode of creation of this singular kind of territory is at once conspicuous. Loose particles of sand are blown in his face; and as he descends to the shore, he sinks to the ankle in the drifted heaps. In some parts of these dreary solitudes, the sandy soil has been prevented from rising with the wind and injuring the fertile country, by being sown with the seeds of a kind of bent-grass, and in a few spots fir-trees have been successfully planted.'—*Tour in Holland*, by W. Chambers. The English term *down* (q. v.) has a similar meaning.

**DUNFE'RMLINE**, a royal burgh in Fife, of the western district of which it is the chief town, under the jurisdiction of a sheriff-substitute, who holds courts twice a week during the session. The town is situated on a long swelling ridge, 3 miles from the Firth of Forth, and 16 miles west-north-west from Edinburgh, 300 feet above the mean level of the firth, and seen from the south, has an imposing appearance. The date of the origin of the town is not known, but it was a place of note before the end of the 11th century. Here, King Malcolm Canmore and his queen, St Margaret, between the years 1070 and 1093, founded an abbey for Benedictines brought from Canterbury. In 1303—1304, Edward I. of England wintered here, the buildings being then described as capable of accommodating three kings and their suites. In 1588, D. was created a royal burgh by James VI. David II., James I. of Scotland, and Charles I., were born here; and Malcolm Canmore, his queen Margaret, Edgar, Alexander I., David I., Malcolm the Maiden, Alexander III., Robert Bruce, his queen Elizabeth, and nephew Randolph, Annabella, queen of Robert III., Robert Duke of Albany, governor of Scotland, were buried in the abbey and its precincts. The tomb of Robert the Bruce was discovered at the building of the new church, which was opened in 1821. The skeleton of the king was disinterred, and a cast was taken of the cranium. Some interesting fragments of the ancient regal and ecclesiastical magnificence of D. still remain. What is called Malcolm Canmore's Tower is a mass of shapeless ruins, but the south wall of the palace of the Stuarts still exists, overhanging the romantic glen of Pittencrieff, a noble wreck, with massive flying buttresses. Of the abbey, the Frater Hall or refectory, and a tower and arched gateway, still remain. The nave of the abbey church, consecrated in 1150, is in the Romanesque style, 106 feet long, and 55 wide. The choir, built about 1250, a fine example of the First Pointed style, was taken down in 1818—1821, when it was replaced by what is now the parish church, surmounted by a square tower 100 feet high, round which is the inscription, in open hewn capital letters, 'King Robert the Bruce.' The modern history of D. is chiefly remarkable in connection with the rise of Scottish dissent, Ralph Erskine and Thomas Gillespie having respectively been founders of the Seceder and Relief bodies, now joined under the name of United Presbyterians. The staple trade of the town is damask linen-weaving, which took its rise about the beginning of last century; there are likewise large collieries and lime-works, iron foundries, breweries, dye-works, a soap-work, a flax spinning-mill, bleach-works, four power-weaving, besides several hand-loom factories. See article Damask. The public buildings are—town-house and county buildings, each having a spire, and the prison, poors-house, and music hall. There are eight fairs, a monthly cattle-market, and two weekly markets for grain and country produce. Pop. of parish (1861), 20,952, of which the town contains 13,504. It joins with Stirling, Inverkeithing, Queensferry, and Culross in returning a member to parliament.

**DUNGA'NNON**, a parliamentary and municipal burgh in the east of Tyrone, near a tributary of the Blackwater, eleven miles north-north-west of Armagh, and eight west of Lough Neagh. It lies on a hill-slope, in a densely peopled district, with high mountains to the west. It is well built, and consists of a square with diverging streets. In the vicinity are the largest lime-quarries and collieries in Ulster. The chief manufactures are linen, coarse earthen-ware, and firebrick. Pop. (1861) 3886. It sends one member to parliament. It was the chief seat of the O'Neils, the kings of Ulster, till 1607. Its castle was destroyed by the parliamentary forces in 1641.

**DUNGA'RVAN**, a parliamentary and municipal burgh, seaport, and bathing-place, in the south of Waterford county, 25 miles west-south-west of Waterford. Pop. of parliamentary burgh (1861) 8614, chiefly engaged in hake, cod, herring, &c. fisheries. The chief exports are grain, butter, cattle, and fish. Vessels of more than 250 tons cannot discharge at the quay. D. has the remains of an Augustinian abbey, founded in the 7th c. by St Garvan. It has besides the remains of walls built by King John, who also built the castle, now a barracks.—Dungarvan Bay is three miles across and three deep, with one to five fathoms of water.

**DUNG BEETLE**, the common name of many coleopterous insects of the tribe *Scarabæides*, which feed upon the dung of animals, and for the most part live in it. They are found in all parts of the world. Many of them belong to the section of *Scarabæides* called *Coprophagi* (Gr. dung-eaters); but others, as the Dor, or Shard-born Beetle (*Geotrupes stercorarius*), to the section called *Arenicoli* (Lat. sand-dwelling), distinguished by peculiarities in the antennæ, mandibles, &c. Neither section, however, consists exclusively of insects entitled from their habits to be called dung beetles, some of the *Coprophagi* feeding chiefly on marine vegetables in a state of putrescence, and some of the *Arenicoli* on the roots of plants. The Dor is one of the most common British beetles; it is of a stout form, less than an inch long; black, with brilliant metallic and blue reflections on the under surface; it may often be heard droning through the air towards the close of the summer twilight, and finds its way with rapidity and certainty to cow-dung, on which it feeds, and under which it burrows, making a large cylindrical hole, often of considerable depth, and depositing therein its eggs, enveloped in a mass of dung. These habits—more or less modified—are shared by many other species, which thus not only hasten the removal of what would otherwise become offensive on the surface of the ground, but even distribute it in the soil, where it affords nourishment to plants.—The sacred beetle or Scarabæus (q. v.) of the Egyptians (*Scarabæus sacer*, or *Ateuchus sacer* of modern entomologists) is a true D. B., one of the *Coprophagi*, in size and colour much resembling the dor. It is found not only in Egypt, but in the south of Europe and west of Asia, and deposits its eggs in dung, which it rolls into little balls for the purpose. A nearly allied insect (*Gymnopleurus pilularius*), a native of North America, is known as the Tumble-dung Beetle, from its habit of rolling globular pellets of dung to the place where they are to be buried in the earth. Several individuals sometimes combine their strength in this curious operation, which is performed by the hind-feet pushing backwards.—The dor, and some other dung beetles, simulate death to deceive their enemies when they apprehend danger, not, like many insects,

Dung Beetle (*Geotrupes stercorarius*).

by contracting their bodies as much as possible, and drawing in their legs, but by stretching every part out to the utmost, and rigidly fixing themselves in that position. Crows and other birds are supposed to prefer them in a living state.

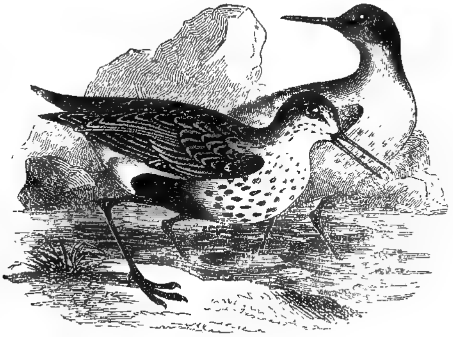
**DU'NGEON.** See Donjon.

**DUNKE'LD**, a city and burgh of barony in the east of Perthshire, 15 miles north-north-west of Perth. It lies in a deep romantic hollow, on the great east pass (of Birnam) to the Highlands, on the left bank of the Tay, across which it communicates with the south by a handsome bridge, built in 1809 by the Duke of Athole. It is environed by dark-wooded and craggy mountains. Pop. (1861) 929. D. is a place of great antiquity, dating probably from the 7th or 8th century. About the year 1130, King David I. made it the seat of a bishopric, of which the Culdees of the ancient abbey were the chapter. The choir of the cathedral, chiefly in the First Pointed style, was built between 1318 and 1337; the nave, in the Second Pointed style, was built between 1406 and 1464; and the tower and chapter-house, also in the Second Pointed style, were built between 1470 and 1477. The choir is now the parish church. The nave, which is in ruins, contains one or two ancient monuments. The monument of the Wolf of Badenoch (Alexander Stuart, Earl of Buchan, who died in 1384) lies in the vestibule. The Duke of Athole's grounds, unsurpassed in Scotland for extent and beauty, lie on the west and north of D., and include the cathedral; Craigvinean and Craig-y-Barns; 50 miles of walks, and 30 miles of drives; falls of the Bran (upper one, 80 feet), near Ossian's Hall at the Rumbling Bridge; and 20 square miles of larch-wood, including the first two larches planted in Britain (in 1737). D., in ancient times, is said to have been the seat of the Pictish kings. It was the seat of a diocese from 1127 to 1688. Three miles south of D. stood Birnam Wood, so famous in connection with the fate of Macbeth.

**DUNKIRK**, or **DUNKERQUE**, the most northerly seaport and fortified town of France, stands on the eastern shore of the Strait of Dover, in the department of Nord, its distance from Paris being in a direct line about 155 miles north, and from Lille about 43 miles north-west. The town, which is connected by railway and canal with the principal manufacturing centres of Belgium and France, is surrounded by ramparts and ditches, and is defended by a citadel. It is well built, the streets spacious and well paved, the houses chiefly of brick. Its quay and pier, its church of St Eloi—a Gothic structure, having a handsome though rather incongruous frontispiece in its Corinthian portico—its town-hall, barracks, college, and theatre, are the principal architectural features. The harbour of D. is shallow, and the entrance difficult, but the roadstead is large and safe. D. has manufactures of soap, starch, beer, beetroot-sugar, cordage, and leather; also metal foundries, distilleries, salt-refineries, and ship-building yards. Forming as it does the outlet for the great manufacturing department of Nord, its trade by sea is very considerable. Since becoming a free port, it has also carried on a good trade in wine and liqueurs. Its cod and herring fisheries are actively prosecuted. The immediate vicinity of D. has a dreary and uninteresting appearance. Pop. 26,132.

D. is a place of considerable historic interest. It owes its origin, it is said, to the church built by St Eloi in the 7th c., in the midst of a waste of sand-hills or dunes, and hence its name, 'Church of the Dunes.' D. was burned by the English in 1388, taken by them under Oliver Cromwell in 1658, but sold to Louis XIV. by Charles II. for a sum of money in 1662. By the treaty of Utrecht in 1715, the French were compelled to destroy the fortifications of D., which were again restored, however, in 1783. In 1793, the allies under the Duke of York laid siege to D., but were compelled by the French to retire, after having suffered severely. D. was made a free port in 1826.

**DU'NLIN**, or **PURRE** (*Tringa alpina*, *T. cinclus*, or *T. variabilis*), a bird of the family *Scolopacidæ* (Snipes, &c.), and of the large group to which the names Sandpiper and Stint are variously given. It is not quite nine inches in length from the extremity of the bill to that of the tail. The plumage undergoes great variations in summer and winter. It is a very widely diffused bird. In summer, it frequents even the desolate shores of Melville Island. It is to be seen in autumn and winter on the shores of Britain and of most parts of Europe; often in very great numbers on sandy or muddy sea-shores; and is equally common on those of America from the Gulf of St Lawrence to the Gulf of Mexico. It exhibits great restlessness and activity in running about, searching and probing for its food. 'When flying in great autumnal flocks, its aërial movements are extremely beautiful, each individual of the vast assemblage yielding so instantaneously to the same impulsion as to exhibit alternately the upper and the under surface of the body, so that we have for a time a living moving cloud of dusky brown, and then a brilliant flash of snowy whiteness.'



Dunlin (*Tringa alpina*):
Summer and winter plumage.

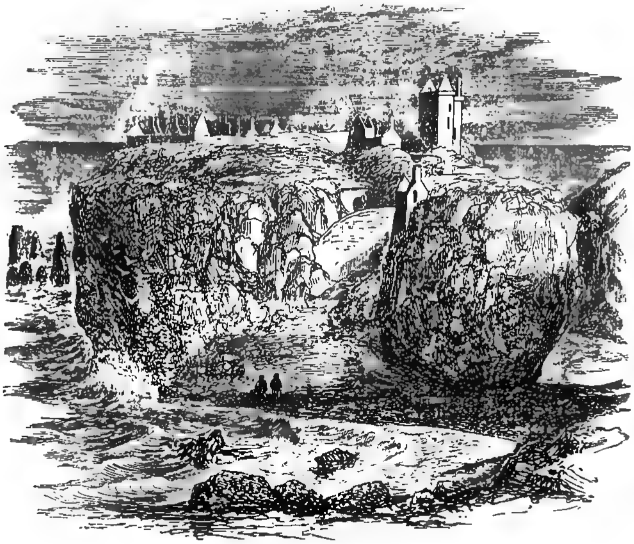
**DU'NMOW FLITCH OF BACON**, a prize instituted at Dunmow, in Essex, in 1244, by Robert de Fitzwalter, on the following conditions: 'That whatever married couple will go to the priory, and kneeling on two sharp-pointed stones, will swear that they have not quarrelled nor repented of their marriage within a year and a day after its celebration, shall receive a flitch of bacon.' The prize was first claimed in 1445, two hundred years after the prize had been instituted, and since that time it has been awarded only on eight occasions, of which the last two were in 1855 and in 1860. Endeavours are being made to perpetuate the custom.

**DU'NNAGE**, on shipboard, is a name applied to miscellaneous fagots, boughs, bamboos, old mats or sails, and loose wood of any kind, laid in the bottom of the hold to rest the cargo upon; either to keep the ship in trim, or to preserve the cargo from damage by leakage.

**DU'NNET HEAD**, a rocky peninsula, 100 to 600 feet high, the most northerly point of Scotland, on the north coast of Caithness, in lat. 58° 40′ N., and long. 3° 21′ W. It consists of upper old red sandstone, resting on the middle flagstone of the same system. It is frequented by various species of sea-fowl, among which is the puffin.

**DU'NNOCK.** See HEDGE-SPARROW.

**DUNNO'TTAR CASTLE**, the ancient seat, now in ruins, of the Keiths, the Earls Marischal of Scotland, on the Kincardineshire coast, a mile and a half south of Stonehaven. It occupies the top of a rock 3 acres in extent, and 160 feet high, overhanging the sea, with a deep though dry chasm between it and the mainland, and it is approached by a steep winding path. In 1296, Wallace is said to have taken the rock and the kirk of Dunnottar from the English. During the Commonwealth, the Regalia of Scotland were hid in the castle from the republican army, and before the garrison surrendered to Cromwell's troops in 1651, the Regalia were removed and secreted in the church of Kinneff, by Mrs Grainger, the minister's wife. In the times of James II. and Charles II., D. C. was one of the state prisons, where the Covenanters were confined. It was dismantled after the rebellion of 1715, on the attainder of the last Earl Marischal.



Dunnottar Castle.

**DUNOIS**, JEAN, called the Bastard of Orleans, Count of Dunois and Longueville, one of the most brilliant soldiers that France ever produced, was born about the year 1403. He was the natural son of Louis Duke of Orleans, brother of Charles VI., and was brought up in the house of that prince along with his legitimate children. D. is said to have been intended for the church, but this is doubted. His first important military achievement was the overthrow of the English at Montargis (1427). He next threw himself into Orleans with a small body of men, and bravely defended the place till the arrival of the famous Joan of Arc, whose religious enthusiasm combined with the valour of the Bastard raised the drooping spirits of the French, and the English were obliged to raise the siege. This was the turning-point in the fortunes of the French nation. In 1429, D. and the Maid of Orleans won the battle of Patay, after which he marched, with a small body of men, through the provinces then overrun by the English, and took the fortified towns. The capture and death of Joan of Arc arrested for a moment the progress of the French arms, but the heroism of D. was irresistible. He took Chartres, the key of Paris, forced Bedford to raise the siege of Lagny, chased the enemy from Paris, and within a very short period deprived them of all their French conquests except Normandy and Guienne. The next grand series of successes on the part of D. was the expulsion of the English from Normandy. Town after town yielded—Rouen, Harfleur, Honfleur, Caen, Falaise, Cherbourg. This splendid campaign lasted only a year and six days. Not less triumphant was his career immediately after in Guienne; Montguyon, Blaye, Fronsac, Bordeaux, and lastly Bayonne, fell into his hands. The English, in fact, were swept out of the country, and the freedom of France from all external pressure permanently secured. Louis XI., on his accession to the throne in 1462, despatched D. as governor to Genoa, which had yielded itself to France, but soon after, in a fit of jealousy and suspicion, deprived him of all his offices. D. now placed himself at the head of the alliance *Pour le Bien Public*, and by the treaty of Conflans, 1465, recovered all his confiscated estates. He died 24th November 1468. There is no name so popular in France as that of D.; there is no hero so national; he laboured 25 years for the deliverance of his country, and this *alone*—his sword was never unsheathed, except against the English. He never had a force under him which could enable him to win a victory that might balance Agincourt or Crécy, but the multitude and constancy of his petty successes served the cause of France more effectively than great and sanguinary contests would have done.

**DUNOO'N**, one of the most frequented sea-bathing places and summer residences in the west of Scotland, is situated in the south-east of Argyleshire, on the west side of the Firth of Clyde, nine miles west of Greenock. A village existed here from a very early date, but a new well-built town, with fine villas around, has of late years sprung up. The population fluctuates from 1500 to 2500.

Dunoon Castle, of which only a small part now remains, stood on a conical hill near the pier, and was once a royal palace and strong fortress. The Argyle family once lived here, but the building became a ruin about 1700.

**DUNSE**, a burgh of barony in the Merse, in the middle of Berwickshire, the largest town in the county, on an eminence on the Whitadder, 44 miles south-east of Edinburgh, and 13 west of Berwick-on-Tweed. Pop. (1861) 2556. To the north of the town is Dunse Law, 630 feet high.

**DUNSI'NNANE**, one of the Sidlaw Hills, in the east of Perthshire, 1114 feet high, 7 miles north-east of Perth, and looking towards Birnam Hill (q. v.). On the top are the remains of the rampart and fosse of an ancient fortification, popularly called Macbeth's Castle.

**DUNS SCO'TUS**, one of the most famous and influential of the scholastics of the 14th century. His history is involved in considerable obscurity. England, Scotland, and Ireland all contend for the honour of having given him birth, but without anything to offer in support of their respective claims beyond inference from his name. As to the date of his birth, all that can be said is, that it was in the last half of the 13th century. Whatever was the history of his youth, he entered early the order of Franciscans, studied at Oxford, and soon became professor of theology. His prelections were attended by crowds of auditors, the number of students at Oxford then exceeding 30,000. About 1304, he removed to Paris, then the chief seat of scholastic philosophy, where he taught theology with great applause. He was especially distinguished for the zeal and ability with which he defended the immaculate conception of the Virgin against Thomas Aquinas. He is said to have demolished 200 objections to the doctrine, and established it by a cloud of proofs. It continued long a point of dispute between the Scotists and Thomists; and it was only in 1854 that the dogma was by papal authority declared a necessary doctrine of the Catholic faith, which it is now heresy to deny. In 1308, D. S. was called to Cologne to oppose the heresies of the Beguin brethren, and there he suddenly died, in the 34th or 43d year of his life. D. S. was mostly opposed to Thomas Aquinas in theological opinions, and held very tenaciously the doctrine of the absolute freedom of the human will, from whose spontaneous exercise he derives all morality. He was a realist in philosophy, and his followers are on that ground opposed to the Occamists, who were nominalists. See NOMINALISTS AND REALISTS. He defended his opinions in the style of dialectic then in vogue, and with an acuteness that got him from his contemporaries the name of Doctor Subtilis. When, however, at the revival of learning, the followers of Duns, or *Dunsmen*, saw that the hair-splitting style of reasoning was going out of fashion, they 'raged,' as old Tyndal says, 'in every pulpit' against the new classic studies, so that the name gradually came to signify not only one opposed to learning, but one slow at learning; hence our word *dunce*, a blockhead. It would be difficult to indicate the nature of his speculative opinions without entering into particulars, nor are his writings as yet sufficiently known and explored for the formation of a decided judgment. The most famous of his works, besides his commentaries on the Bible and on Aristotle, is his Commentary on the Sentences of Peter Lombard, called the *Opus Oxoniense*, of which the *Opus Parisiense* is an abridgment. The chief edition of his works is that of Luke Wadding (12 vols., Lyon, 1639), but it is by no means complete. The controversies carried on so long between the Scotists and Thomists owed their bitterness not so much to zeal for science and religion, as to the jealousy existing between the Franciscans and Dominicans.

**DU'NSTABLE**, a town in the south of Bedfordshire, at the east base of the Chiltern chalk-hills or Dunstable Downs, 18 miles south-south-west of Bedford. It chiefly consists of one main street crossed by another. The houses are mostly of brick, some of them very old. Pop. (1861) 4467. D. is the chief seat of the British straw-plait manufacture, which employs many women. Whiting is also made. In winter, many large larks are caught in the neighbourhood, and sold chiefly in London as an article of luxury. Henry I. founded here a priory of Black Canons, of which the present parish church is a part. D. was in 1110 the scene of some of the earliest theatricals, the subject being the miracles of Catherine, by Abbot Geoffry of St Albans.

**DU'NSTAN, ST**, was born at or near Glastonbury, in Somersetshire, 925 A. D. He was of noble birth, and even remotely related to the royal family, as well as connected with the church through two uncles, one of whom, Adelm, was Archbishop of Canterbury. His early studies were pursued with extraordinary assiduity; but besides his professional learning, D. possessed a variety of accomplishments. He was an excellent composer in music; he played skilfully upon various instruments; he was a painter, a worker in design, and a caligrapher; a jeweller, and a blacksmith. After he had taken the clerical habit, he was introduced by his uncle Adelm to King Athelstane, who seems to have been delighted with his music; but the courtiers envying the favour of the sovereign, denounced him as a dealer in sorcery, and procured his expulsion from court. D. now began to figure in a new character. Contiguous to the church of Glastonbury, he erected a cell, five feet in length by two in breadth, the floor of which was sunk beneath the surface, while the roof, on the outside, was only breast-high, so that he could stand upright in it, though unable to lie at full length. This was at once his bed-chamber, his oratory, and his workshop. It was here that (according to the monkish legends) he had his most celebrated contest with the devil. One evening, while the saint was employed at his forge, the devil thrust his head in at the window, and began to tempt him with some immoral propositions. D. patiently endured the annoyance until his tongs were red hot in the fire, when, snatching them suddenly up, he seized the foul fiend by the nose, and held him till the whole neighbourhood resounded with the clamour of his agony. Gradually, D. acquired a great reputation for sanctity; and on the accession of Edmund to the throne in 940, he was recalled to court; but in spite of the exploits and penances which had made his banishment illustrious, he was still opposed by the courtiers, who saw his ambition, and dreaded his talents. A second time D. was dismissed, but the king made him Abbot of Glastonbury, and increased the privileges of that monastery. Edred, nicknamed *debilis pedibus* (weak in the feet), who succeeded Edmund in 946, shewed D. great favour. The saint now began to distinguish himself as a statesman, and the vigorous policy of Edred's reign is affirmed to have proceeded from the inspiration of Dunstan. If such was the case, then to D. was owing the complete subjugation of the Northumbrian Danes. Edred was succeeded by Edwy in 955, who detested D., and not without reason, for the saint, on the day of Edwy's coronation, had grossly insulted his wife and her mother. Besides, Edwy had long suspected D. of peculation in his charge, and this outrage made his wrath overflow.

D. was deprived of his clerical office, his places at court were taken from him, his so-called reform—viz., of compelling the clergy to become celibates—was frustrated, the monks were driven out of their monasteries, their functions handed over to the secular clergy, and D. himself was banished. He fled to Flanders, narrowly escaping having his eyes put out by the messengers whom the infuriated king had sent after him. After D.'s flight, a rising took place among the Northumbrian Danes, instigated by Odo, Archbishop of Canterbury, himself a Dane, and a friend of the expatriated saint. Edgar, the brother of Edwy, was chosen king of the whole of the island north of the Thames, and D. returned in triumph from his brief exile. Meanwhile, Edwy's beautiful wife, Elgiva, had been seized and murdered, under circumstances of horrid cruelty, by the Mercians, who were armed in the cause of D. and Odo, or, as others say, by the immediate retainers of these churchmen themselves. Edwy himself died of a broken heart, or (according to an old MS. in the Cottonian Library) was assassinated, in 958, and was succeeded by his brother Edgar. The latter, as a boy of 15, could exercise little authority: he was long a passive instrument in the hands of D. and his party, who used their power in establishing their cause over the whole island, in enforcing the celibacy of the clergy, and in driving out by main force from all abbeys, cathedrals, and churches, all such married clergymen as would not separate from their wives. At the same time, it cannot be denied that D. and the monks ruled the kingdom with vigour and success, and consolidated the detached states into compacter integrity and union than had ever been known before. The Danish districts of Anglia and Northumbria were divided into earldoms or governments; the fleet of the king was increased to 360 sail, which acted as a most efficient coast-guard, preventing the Norse rovers from making their usual destructive descents on the country. In 960, D. was made Archbishop of Canterbury on the death of his friend Odo, when, according to custom, he went to Rome to receive the pall at the hands of the pope. He also induced Edgar to visit in person every part of his dominions annually, when courts of justice were held in the various districts, audiences and feasts given, and appeals heard. The many other beneficial measures of Edgar's reign, such as the reform of the coinage, and the endeavour to extirpate wild animals in the mountainous districts, are generally, and with good reason, attributed to Dunstan. The king, who was zealous for the celibacy of the clergy, was himself one of the most viciously profligate of the Saxon kings; yet D. could wink at his crimes, so long as he himself was allowed to carry out his 'religious' schemes. On the death of Edgar, a fierce struggle took place between the partisans of Edward the Martyr and his half-brother Ethelred. The cause of the former was espoused by D., who succeeded in placing his favourite on the throne; but the mother of Ethelred, named Elfrida, a beautiful but ferocious woman, caused Edward to be murdered in 979, and D. was compelled to place the crown on the head of Ethelred. The credit and influence of the great monk now declined; his threatenings of divine vengeance were treated with contempt; and soured and exasperated at the triumph of his enemies, he retired to his archiepiscopal city, where he died of grief and vexation, May 19, 988. D. was a man of extraordinary abilities. His vigour, his persistency of purpose, and his stern and unscrupulous disposition, would have elevated him to power in any age; but he possessed, in addition to these qualities, a deep knowledge of the weaknesses of human nature, and a clear and penetrating understanding, which enabled him to see what it was necessary and prudent for a ruler to do. Hence, though despotic to the last degree, he was not blindly so, like a common-place despot. His ambition was ever under the control of his wisdom and his fixed ideas. But the grand designs of his life—viz., the complete subjection and conformity of the Anglo-Saxon church to that of Rome, and the extension and multiplication of ecclesiastical interests—are not such as excite the admiration of modern times, and all discerning people will regret the success that attended the unpatriotic labours of the saint. That he *was* successful, there can be no manner of doubt. Though personally out of favour at court in the latter years of his life, his efforts to spread his official influence were unceasing. At an early period in his career, he had introduced a new order of monks into the land, the Benedictines, whose strict discipline had changed the character and condition of ecclesiastical affairs, and in spite of the confusion and even opposition thus caused, he persevered to the end. Monasteries continued to be founded or endowed in every part of the kingdom; and such were the multitudes who devoted themselves to the cloister, that the foreboding of the wise Bede was at length accomplished—above a third of the property of the land was in possession of the church, and exempted from taxes and military service. D.'s *Concord of Monastic Rules* will be found in Reyner's *Apostolatus Benedictinorum in Anglia*, fol., Duac. 1626, page 77 of the Appendix. Other writings have been attributed to him. See Wright, *Biog. Brit. Lit.*, *Ang.-Sax. Period.* For further information, consult William of Malmesbury, Lingard's *History of England*, and Kemble's *Saxons in England*, book ii.

**DUODE'CIMAL SCALE** (Lat. *duodecim*, twelve) is the name given to the division of unity into twelve equal parts, as when the foot is divided into 12 inches, and the inch into 12 lines; or the pound is divided into 12 ounces. This plan of counting by dozens has some advantages, as 12 admits of so many divisions into equal parts—viz., by 2, 3, 4, and 6. But the decimal scale, or division into ten equal parts, is now universally recognised as preferable, from its coinciding with our decimal system of notation.—Duodecimals is a term applied to a method of calculating the area of a rectangular surface when the length and breadth are stated in feet and inches.

**DUODE'CIMO** (Lat. *duodecim*, twelve) is that form of volume whose leaf is equal to the twelfth part of a folio—the folio being the large sheet called the *broadside*, folded once. A book is said to be *quarto*, *octavo*, *duodecimo*, &c., because the sheet of which the pages of the book are made up has been folded into four, eight, twelve leaves, &c. Quarto, octavo, and duodecimo, are almost always written 4to, 8vo, and 12mo.

**DUODE'NUM.** See Digestion.

**DUPIN,** André-Marie-Jean-Jacques, a French statesman and lawyer, was born, 1st February 1783, at Varzy, in the department of Nièvre, and studied in Paris. In 1815, he was elected a member of the Chamber of Representatives, when he opposed the motion for proclaiming Napoleon II. successor to the throne. During the same year, he published his treatise, *Sur la Libre Défense des Accusés.* The attention excited by this work procured him the honour of defending Marshal Ney, and afterwards the English officers, Wilson, Bruce, and Hutchinson, accused of having favoured Lavalette's escape. He had also the honour to defend the poet Béranger in 1821. From 1825 to 1829, he was the advocate of the liberal party. In his pamphlet, *La Révolution* *de* 1830, he endeavoured to prove the legal character of this revolution; and on the question being mooted whether the new king should assume the title of Philippe VII., D. declared 'that the Duke of Orleans was called to the throne not *because* he was a Bourbon, but *although* he was a Bourbon, and on the condition that he should not follow in the footsteps of his predecessors.' After having been appointed to various important offices by the new government, D. found it necessary to pass over to the opposition, and was eight times chosen president of the Chamber of Deputies. On the revolution of 1848, he urged (but unsuccessfully) the Chamber to proclaim the Comte de Paris king of the French, with the Duchess of Orleans regent during his minority. In consequence of the confiscation of the Orleans estates in 1852, D. resigned his place, and retired for a time from public life; but in 1857 he consented to resume his previous office of *Procureur-General* of the Court of Cassation. He has written many important works, mostly on legal questions, among which may be mentioned his *Manuel du Droit Ecclesiastique Français*, which had the high honour of being censured by the congregation of the *Index* at Rome. In 1853 appeared his *Le Morvan; Topographie, Agriculture, Mœurs des Habitants, Etat Ancien, Etat Actuel;* and in 1857, *Règles Générales de Droit et de Morale tirées de l'Ecriture Sainte.*

**DUPIN**, François-Pierre-Charles, Baron, a French economist, brother to the preceding, was born at Varzy, in the department of Nièvre, 6th October 1784, and educated at the Polytechnic School, Paris. During the Empire, he was actively employed as an engineer. Between 1816—1819, he made several visits to England and Ireland, to study the great works of construction in those countries. The results of his investigations appeared in his *Voyages dans la Grande Bretagne* (6 vols., Paris, 1820—1824, with atlas)—a comprehensive statement of the advantages and defects of British internal administration, exhibiting in a popular form a complete view of the roads, canals, aqueducts, bridges, ports, &c., of this country. D. was about this time appointed member of the Académie des Sciences, and in 1824 was raised to the rank of baron. In 1828, he was elected deputy for the department of Tarn, and he took part with the liberal opposition. After the February revolution of 1848, D. was elected member of the Constituent Assembly by the department of Seine-Inférieure. After the *coup d'état*, he became a senator of the Empire. D. has published a multitude of works on geometry, naval affairs, commerce, &c.

**DU PLESSIS-MORNAY.** See Mornay.

**DUPLICATE RATIO.** See Proportion.

**DUPLICATION OF THE CUBE.** See Doubling the Cube.

**DUPONT**, Jacques Charles, styled De L'Eure, a leader of the French liberal party, born 27th February 1767 at Neubourg, in Normandy. During the periods of the Revolution and the Empire, he filled several important offices. In 1813, he became a member of the legislative body, and acted as vice-president when this assembly was convoked by Louis XVIII. on the fall of Napoleon. During the Hundred Days he was elected to represent the department of Eure, and, after the battle of Waterloo, became vice-president of the Chamber of Representatives. After the revolution of 1830, he was appointed Minister of Justice, but at the end of six months sent in his resignation, and took his place in the ranks of the opposition. After the revolution of 1848, during the session of the 24th February, D. took the president's chair, and so far silenced the tumult of the populace, as to render it possible to appoint a provisional government, of which he was proclaimed president. He died in 1855. His political friends styled him the most virtuous among the virtuous, the Aristides of French liberalism. His disinterestedness was not denied even by his enemies; but he manifested fidelity to his convictions rather than energy of character.

**DUPUIS**, Charles François, a distinguished French *savant*, was the son of a poor schoolmaster, and was born at Trie-Chateau, near Chaumont, 16th October 1742. He obtained admission into the college of Harcourt, where he so soon acquired such extensive knowledge that at the age of 24 he was made Professor of Rhetoric in the college of Lisieux. At the same time he went through a course of law-studies, and was admitted an advocate of the parliament. His acquaintance with Lalande introduced him to the study of mathematics and astronomy, and he was led to the thought of explaining mythology by means of astronomy. After several communications in the *Journal des Savans*, appeared his *Mémoire sur l'Origine des Constellations et sur l'Explication de la Fable par l'Astronomie* (Par. 1781). He was now appointed Professor of Eloquence in the Collége de France, member of the Académie des Inscriptions, and shortly after a member of the commission of public instruction. Although he rather shunned the storms of the Revolution, his reputation necessitated his becoming a member of the Convention, next of the Council of 500, and after the 18th Brumaire, of the legislative body. He was also one of the 48 individuals who formed the nucleus of the Institut National. His great work, *Origine de tous les Cultes, ou Religion Universelle* (12 vols., Par. 1794), which he had long withheld from fear of offending the religious world, was at last published at the instigation of the Cordeliers' Club. This circumstance rendered the book more an object of party bitterness than its own purely scientific character would probably have called forth. It made a considerable impression on France at the time, and no doubt originated the famous commission afterwards appointed by Napoleon to explore Upper Egypt, which D. had pointed out as the general source of southern mythology. No less attention was awakened by his memoirs on the origin and spread of the Pelasgi, and on the zodiac of Denderah (q. v.). In his last work, *Mémoire Explicatif du Zodiac Chronologique et Mythologique* (Par. 1806), he attempts to demonstrate the unity of the astronomical and religious myths of all nations. He died 29th September 1809.

**DUPUYTREN**, Guillaume, le Baron, an illustrious French surgeon and anatomist, was born at Pierre-Buffière, in Limousin, 6th October 1777; educated at the Collége de la Marche in Paris; and on the formation of a new school of medicine there in 1794, was appointed to the office of *prosecteur*. In 1801, he was appointed *chef des travaux anatomiques*, and applied himself with intense ardour to pathological anatomy. In 1803, he was appointed assistant-surgeon, and later, in 1815, first surgeon at the Hôtel-Dieu. In 1813, he became professor of surgery to the medical faculty, an office which he exchanged, in 1818, for the professorship of clinical surgery at the Hôtel-Dieu. In 1820, Louis XVIII. conferred on him the title of baron, and in 1823, appointed him royal surgeon. He died at Paris, 8th February 1835. D. possessed extraordinary penetration in diagnosis, a penetration that was generally justified by his bold and skilful operations, and an immovable firmness of nerve. He is the inventor of many ingenious modes of surgical operation and of various surgical instruments. He has likewise made several important discoveries in pathological anatomy; and although he wrote very little, almost nothing indeed, he formed a large school of enlightened surgeons in his native country. Among his works may be mentioned *Leçons Orales de Clinique Chirurgicale faites à l'Hôtel-Dieu* (4 vols., Par. 1830—1834), published by some of his students; and his *Traité Théorique et Pratique des Blessures par Armes de Guerre*, edited by Paillard and Marx (2 vols., Par. 1834).

**DUQUESNE**, Abraham, Marquis, one of the most eminent naval officers of France, was born at Dieppe in 1610, and trained under his father, the captain of a ship, for the naval service. In the war between France and Spain, he brilliantly distinguished himself at Corunna, Tarragona, Barcelona, and other places. During the minority of Louis XIV., when the navy of France was inactive, he entered the service of Sweden, which was then at war with Denmark. D. defeated the Danish fleet near Gothenburg in 1643, was elevated to the rank of vice-admiral, and by a succession of victories over the united fleets of Denmark and Holland, forced Denmark to conclude peace. He then returned to France, where he found the Spaniards prepared to support Bordeaux, which had declared itself for the party of the *Fronde* in 1650. D. immediately collected a squadron at his own expense, and compelled Bordeaux to submit. He was next employed in punishing the pirates of Algiers and Marocco who infested the Mediterranean. On the revolt of Messina against the Spanish government, France sent him to support the insurgents in the Mediterranean. With a small force, D. gallantly opposed the united fleets of Spain and Holland, commanded by De Ruyter, and in April 1676, completely defeated his enemies off the coast of Sicily, in the vicinity of Mount Etna. De Ruyter died a few days after. France thus obtained possession of the island of Sicily. Louis XIV. rewarded D. with the title of marquis and a considerable estate. On the revocation of the Edict of Nantes, D. was made the only exception to the general decree of banishment issued against all Protestants. His last achievement was the humiliation of Genoa. D. died at Paris, 2d February 1688.

**DU'RA DEN**, between Cupar and St Andrews, in Fifeshire, a small glen through which runs a tributary of the Eden, has become famous on account of the numerous and beautifully preserved fossil fish entombed in its yellow sandstone. This sandstone is one of the upper beds of the Old Red Sandstone. It is developed in D. D. to a thickness of 300 or 400 feet, and is rich in the remains of ganoid fishes. They occur in clusters and detached groups, sometimes crowded together in an extraordinary manner, so that nearly a hundred specimens have been counted on a single slab about five feet square. They are found only in one thin layer, no fragment of skeleton or scale having been obtained in any other portion of the sandstone. The specimens are beautifully preserved; they often exhibit the rounded plump form of the living animal, in some instances not a scale being displaced; the scales retain their original glistening enamel, very different from the white chalky appearance they present in other localities. The specimens consist of two species of *Holoptychius*, viz., *Andersoni* and *Flemingii;* also of *Dipterus*, *Platygnathus*, *Phaneropleuron Andersoni*, *Glyptolæmus*, *Glyptopomus*, and *Pamphractus*. For further information on this interesting locality of fossiliferous remains, see *Dura Den*, by J. Anderson, D.D. Edin., Edmonston and Douglas.

**DURA MATER.** See Membranes of the Brain.

**DURA'MEN**, or **HEART-WOOD**, in Botany, the inner and fully ripened wood of exogenous trees. The division is often very marked between the *D.* and the *Alburnum* (q. v.) or sap-wood, the D. being more dense and compact, and its tubes thickened and filled with the peculiar secretions of the plant, so that juices no longer freely flow through them. It is also very frequently of a darker colour than the alburnum: in ebony, it is black; and some other trees are remarkable for the peculiar colour of their wood, which appears, however, only in the D., and not in the alburnum. As timber, it is much more valuable and durable than the alburnum; and the distinction is as well known to the carpenter or cabinet-maker as to the botanist.

**DURANCE**, a river in the south-east of France, rises in the department of the Hautes-Alpes, near the base of Mont Genèvre, one of the peaks of the Cottian Alps. It flows through the department of the Basses-Alpes in a southerly direction; then curving westward, it proceeds towards the Rhone, forming the boundary between the departments of Vaucluse and Bouches-du-Rhone, and joins that river about three miles below Avignon. Its principal affluents are the Buech and the Calavon from the right; and the Ubaye, the Bleone, the Asse, and the Verdon from the left. Its total length is about 180 miles—no part of its course is navigable. Its current is swift and impetuous, and carries down with it great quantities of sand and pebbles. Large quantities of timber are floated down from the forest districts upon its banks to Arles, and thence to the Mediterranean. An aqueduct 51 miles long has been recently constructed from the D. to Marseille. This great work not only supplies Marseille with water, but affords water-power for driving machinery, and irrigates an otherwise parched area of 25,000 acres.

**DURA'NGO**, or **GUADIA'NA**, and also recently named **CIUDA'D DE VICTO'RIA**, in honour of the first president of the Mexican Confederation, is a city in Mexico, and stands in the Sierra Madre, at the elevation of 6848 feet—almost a mile and a quarter—above the level of the sea. Lat. 24° 2′ N., long. 104° 3′ W. It is near the Culiacan (q. v.), being 150 miles to the north-west of Zacatecas. It is regularly built, with a cathedral and other churches, and with convents, a theatre, and a mint; and the inhabitants, 22,000 in number, carry on manufactures in iron, wood, wool, and leather. The city gives name to a department containing 54,500 square miles, nearly the area of England, and 150,000 inhabitants—less than the population of Edinburgh.

**DURA'ZZO** (called by the Turks *Dratsch*, and by the Slaves *Durtz*), a maritime town of Albania, European Turkey, is built on the rocky peninsula of Peli, in the Adriatic. Lat. 41° 19′ N., long. 19° 27′ E. It is fortified, and is a place of considerable antiquity. Its situation in a fertile district gives it an export trade in grain, oil, &c.; but in recent years, owing to partial failures in crops, and disease in olives, the exports have been small. D. has large imports of British manufactured goods; and also of sugar, coffee, rice, soap, and iron. Pop. between 9000 and 10,000.

D. is the ancient *Epidamnus*, which was founded about 627 B.C. by a conjoined band of Corcyræans and Corinthians under one Phaleus, a Heracleidan. It became a great and populous city, but was much harassed by the internal strifes of party, which ultimately led to the Peloponnesian War (q. v.). Under the Romans it was called Dyrrachium (whence its modern name), and became the seat of a Roman colony, and an important landing-place for those sailing from Brundusium in Italy to Greece.

Here Pompey was for some time beleaguered by Cæsar. Dyrrachium attained its highest consequence about the end of the 4th c., when it became the capital of the Byzantine eparchy of New Epirus. In the 5th c. it was besieged by Theodoric the Ostro-Goth; in the 10th and 11th, by the Bulgarians; and in 1081 it was captured, after a severe battle, by the Norman, Robert Guiscard of Apulia. In 1205 it fell into the hands of the Venetians; in 1273, it was wholly destroyed by an earthquake, but was soon after rebuilt; and after several other changes, it was finally conquered by the Turks in 1502, in whose possession it still remains.

**DÜ'REN** (the Roman Marcodurum, whence its former name, Mark-Duren), an ancient town of Rhenish Prussia, situated on the Roer, 18 miles east of Aix-la-Chapelle. It is surrounded with walls, and has several churches remarkable for their fine architecture. D. has important manufactures of woollen cloths, iron and steel ware, paper, soap, leather, oil, &c. In the vicinity are iron foundries and other factories worked by water-power, obtained from the Roer. Pop. 8500. Here Charlemagne, on his way to attack the Saxons, held diets in 775 and 779 A. D. After an obstinate resistance, D. was taken and burned by Charles V. in 1543. In 1794, the French made it the capital of the department of Roer; but in 1814 it was handed over to Prussia.

**DÜ'RER**, ALBERT, the father of the German school of painting, 'the prince of artists,' as his countrymen loved to call him, was born at Nürnberg in 1471, according to an entry in his father's day-book, 'on the day of St Prudentius, on a Friday of the holy week.' His father was a humble pious goldsmith, of whom the great painter said: 'His daily speech to us was, that we should abound in love to God, and act faithfully towards our neighbour.' D. was carefully educated and instructed by his father in the goldsmith trade, and at 15 executed a piece of work in chased silver representing the seven 'falls of Christ'—in reference to the tradition that Christ fell seven times while bearing his cross to Mount Calvary. Even as a child, drawing was his delight, and he was wont to astonish by the exactness with which he drew parts of the human body, and even whole figures, also lines and circles at the first stroke, without ruler or compass. His father therefore bound him apprentice, in 1486, to Michael Wohlgemuth, the chief Nürnberg artist, with whom he served three years. From 1490 to 1494 he travelled in Germany and the Venetian States; and on his return, his father 'bargained' with Hans Frei, a skilful mechanic of Nürnberg, to give him to wife his daughter Agnes, who turned out a perfect Xantippe, with nothing to recommend her but beauty and 200 florins, who embittered the whole course of his life, and, as his life-long friend Pirkheimer asserts, hastened his death. After receiving his diploma with all the honours and rights of a master, obtained for his famous drawing of Orpheus, he went to Venice in 1505, where he painted a picture of the martyrdom of St Bartholomew, and one of Adam and Eve, afterwards bought for the gallery at Prague. He also visited Bologna, where it is said that he met with Raphael, who esteemed him highly, and that each painted for the other his portrait. After this journey, his fame spread widely; and the Emperor Maximilian appointed him court painter, with an annuity of 100 florins; and Charles V. confirmed the same in a document still to be seen in the Nürnberg archives. In 1520, he visited the Netherlands with his wife and their maid-servant; and they were splendidly entertained at Antwerp and Bruges by the painters, a costly dinner being served on vessels of silver, the whole party conducting them home late in the night by the light of many torches. His expenses were often defrayed at the inns, and he was escorted free from city to city. He says in his journal: 'The people did obeisance unto me as if they were leading some great lord.' D. warmly embraced the doctrines of the Reformation; and his journal contains a long lamentation and prayer on hearing that Luther had been carried off to the castle of Wartburg. At Antwerp he records: 'I was now overcome by a strange sickness, of which I never yet heard from any man.' This was in 1521, and the 'strange sickness'—no other than consumption—took yet seven years to consume his strong frame; he died in his native city, 6th April 1528, in his 57th year.

D.'s facility was almost incredible. He *thought out* his works, and then executed them without sketch, and never altered a line. Of his colouring, Fuseli says: 'Dürer excelled Raphael in juice and breadth of colouring as much as Raphael excelled him in every other quality.' His drawing was perfect. So quaint were the presentments of his genius, he may be called the Chaucer of painting. In his portraits, he not only caught the expression, but delineated character and passion. D. was the inventor of the art of etching. He found wood-engraving in its infancy, and raised it to be a pattern for all times; he also discovered the method of bringing out wood-cuts in two colours. Historical and other paintings by D. are to be seen at Vienna, Munich, Prague, Dresden, and Nürnberg. The oldest of his pictures extant is the portrait of himself of the year 1498, in the Florentine Gallery. His engravings and wood-cuts are so numerous, that with all his surpassing diligence it is known that for many of them he only gave the designs: 262 wood-cuts are known marked with his name, the most famous of which are the 'Great Passion,' the 'Little Passion,' his favourite work, the 'Revelation of St John,' and the series called the 'Triumph of Maximilian,' a copy of which is in the Advocates' Library in Edinburgh. In the British Museum, there is a volume with more than 200 original drawings by D., formerly in the collection of Sir Hans Sloane, also an exquisite carving in hone-stone, of the Birth of St John, and a number of engravings, bequeathed by Mr Nollekens. His own list of his works enumerates 1254 pieces.

In the last three years of his life he published works on perspective and measurement, on fortification, and on human proportion, of which last he only lived to correct the first volume. His life has been written by Heller, Roth, Campe, and others. Deeply religious and reverent, he was also of a cheerful temperament, and was long chief magistrate of his native town, where there is a brass statue of him, designed by the famous sculptor Rauch, and his house is still to be seen at the corner of a street called by his name.

**DU'RESS**, in English Law, is the plea of a man who has obliged himself to pay or perform, or who has committed a misdemeanour, that he was constrained to do so, and therefore ought to be free from the consequences. There is both *duress* of *imprisonment* and duress *per minas.—Tomlins' Dict.*

**D'U'RFEY**, THOMAS, a writer of plays and poems in the reign of Charles II., by whom he was a favourite for his wit, liveliness, and songs. In literature, he is best remembered for his sonnets, entitled *Pills to Purge Melancholy*, a work found only among the rarities of private libraries. Tom D., as he was usually called, lived to entertain

Queen Anne by singing his catches and glees; but being without any settled means of support, he concluded his career in poor circumstances. Addison, who was his friend, pleaded in his behalf—'He has made the world merry, and I hope they will make him easy, as long as he stays among us. This I will take upon me to say, they cannot do a kindness to a more diverting companion, or a more cheerful, honest, good-natured man.' He died at an advanced age in 1723.

**DU'RGA PU'JA.** See Hinduism.

**DU'RHAM,** a parliamentary and municipal borough, and ancient episcopal city of England, near the middle of Durham county, built around a steep rocky hill 86 feet high, nearly encircled by the Wear. On the top of the hill are the cathedral and castle. Ancient walls partly enclose the hill, from which are fine views of the fertile wooded country around, and of the suburbs across the river. The chief manufactures of D. are carpets and paper. In the vicinity are coal-mines, and saline, chalybeate, and sulphureous springs. Pop. (1861) 13,743. It sends two members to parliament. D. arose about the year 995, when Bishop Aldune brought here St Cuthbert's bones from Ripon, and built a church to enshrine them. On the site of this church, Bishop William de Carilepho, about 1093, began the present magnificent cathedral, a Romanesque structure in the form of a Latin cross, to which additions continued to be made till about 1500. It thus exhibits the gradual changes of style between these periods. It was restored during last century. It is 507 by 200 feet, with a central tower 214 feet high, and two west towers 138 feet high. A plan of it is given in illustration of the article Church. The cathedral contains many old monuments. Here lie St Cuthbert's (q. v.) remains, discovered in 1827, and immediately reinterred. Here, also, are Bede's tomb and some manuscripts said to be in his handwriting. Cardinal Wolsey was a prelate here. The bishop's income is now £8000. The castle, formerly the residence of the bishops of D., but now the seat of the university of D., was founded about 1072, by William the Conqueror, in the Romanesque style, but it has since been much altered. The dormitory, now the new library of the cathedral, which belonged to the monastery of D., is one of the finest in England. Two of the bridges over the Wear were erected in the 12th century. D. was often attacked by the Scots.

A college was founded here in 1290 by the prior and convent of Durham. It was abolished, however, at the dissolution of monastic houses in the reign of Henry VIII., and its endowments given to the dean and chapter of Durham. Under the Commonwealth, Cromwell instituted a college here, and endowed it with the sequestrated revenues of the dean and chapter, to whom, however, these revenues again reverted at the Restoration, when the college was suppressed. The present university of D. was opened for students in 1833, under the provisions of an act of parliament, obtained by the dean and chapter during the previous year. A royal charter in 1837 empowered the university to bestow degrees. The D. university comprises professorships in Divinity, Ecclesiastical History, Classical Literature, Mathematics, and Astronomy, with readers in Law, Hebrew, History and Polite Literature, and Natural Philosophy, and a lecturer in Chemistry and Mineralogy.

**DURHAM,** a maritime county of the north-east of England, between the Tyne and Tees, bounded N. by Northumberland, E. by the German Ocean, S. by Yorkshire, W. by Cumberland and Westmoreland. It is 48 miles long, by 39 broad, with 32 miles of coast, generally low, but with some cliffs; area 973 square miles, $\frac{6}{7}$ being arable. The surface is hilly, and slopes to the east. In the west, which is waste but rich in minerals, are branches of the Pennine chain, rising in Kilhope Law, 2196 feet; Colber Law, 1678; and Pontop Pike, 1018. The two chief branches enclose the valley of the Wear, and send forth several parallel ranges, declining toward the coast, and enclosing many fertile tracts and sheltered valleys. The chief rivers are the Wear, Tyne, and Tees, navigable respectively for 20, 15, and 10 miles. The rocks are new red sandstone, magnesian limestone, millstone grit, carboniferous limestone, rich in lead; and coal-measures, forming the valuable D. coal-field, 25 by 10 miles, with many faults, and with about 40 beds of coal, three to ten feet thick, some of the mines being 1800 feet deep. Basalt and greenstone trap dikes intersect the west part of D., one being 20 miles long, and another 24. The mineral products are coal, limestone, black marble, freestone, ironstone, firestone, slate, millstone, grindstone, and lead. D. is one of the chief counties in England for the production and export of coal: 500 ships are employed at Sunderland for this export alone. Five of the coal-seams, three to eight feet thick, and at the depth of 20 to 100 fathoms, are worked horizontally for many miles. Above 160 miles of railway are connected with the mines and ports. The soil is a clayey or dry loam. The chief crops are oats, barley, wheat, turnips, beans, and pease. The Teeswater or Holderness breed of cattle is famed for fattening, quantity of milk, and early maturity. The D. horses are famed for draught and the saddle. Many sheep are pastured on the hills. There are manufactures of iron, pottery, glass, alkalies and chemicals, and salt, and much shipbuilding at Sunderland and South Shields. Coal is the chief export. It is divided into 4 wards, 14 poor-law unions, and 60 parishes. In 1861, the population amounted to 509,018. In 1851, there were 390,997 inhabitants, 837 schools, with 49,231 scholars; 621 churches (169 Church of England, 351 Wesleyan Methodists). The chief towns are Durham, the county town, Sunderland, Darlington, Gateshead, South Shields, Stockton, and Hartlepool. The county sends four members to parliament. D. has some ancient barrows, and has afforded many Roman antiquities, as altars, urns, and coins. There are the remains of a fine Roman station at Lanchester. D. formed part of the Saxon kingdom of Northumbria (547 to 827). Subsequently, it suffered severely from the incursions of the Scots.

Durham County Palatine, one of the three counties palatine of England, the other two being Lancaster and Chester. For the privileges of a county palatine, see Palatine. The county palatine of Durham existed by prescription. It was the only county palatine in the hands of a subject, and belonged to the Bishop of Durham. By 6 and 7 Will. IV. c. 19, the county palatine of Durham is separated from the bishopric, and vested in the crown.

**DURHAM,** John George Lambton, Earl of, an English statesman, was the son of William Henry Lambton, Esq., of Lambton Hall, county of Durham, and was born at the family seat, 12th April 1792. The Lambton estate was not very large, but had been in the possession of the family since the 12th c., the male issue having never once failed during all that period. The antiquity of the family, however, exercised no narrowing influence on his opinions, which were markedly radical. He was educated at Eton; and when only twenty years of age, married at Gretna Green a Miss Harriet Cholmondeley, who died in the course of a few years. In 1814, he was returned for his native county, and though he did not speak on many questions, he took part in all the more important debates, opposing the Corn-law Bill of 1815, the additions made to the incomes of the royal dukes, the Indemnity Bill of 1818, the six repressive bills brought in by government to coerce the people after the great reform meeting at Manchester in 1819, &c. Two years after, he submitted to the House of Commons a scheme of parliamentary reform, which of course was not accepted. In 1828, he was raised to the peerage, with the title of Baron Durham of the city of Durham. He was one of the four persons who drew up the Reform Bill, and supported it in the House of Lords. In 1833, Lord D. was despatched on a mission to Russia. On his return to this country, his 'advanced liberalism' was proclaimed at a dinner given to Lord Grey at Edinburgh, in 1834, and in various other parts of the country. After a second mission to Russia, he was appointed governor-general of Canada, where he arrived in May 1839; but on account of a misunderstanding with the home government, he took the extraordinary step of returning to England in the course of half a year, without either being recalled or obtaining the royal consent. D. died at Cowes, Isle of Wight, 28th July 1840. He left a son, the present Earl of Durham, and three daughters.

**DU'RIAN**, or **DURION** (*Durio zibethinus*), a fruit-tree of the Malayan Archipelago, of the natural order *Sterculiaceæ*, of the same tribe or sub-order (*Bombaceæ*) with the silk-cotton tree. It is a lofty tree, with leaves resembling those of the cherry, and large bunches of pale-yellow flowers. The fruit is of the size of a man's head, roundish oblong, with a hard thick rind, covered with soft spines, so that it somewhat resembles a hedgehog rolled up. The pulp of the fruit is of a sort of creamy substance and delicious taste, but has a smell which is at first very repulsive to Europeans. Persons accustomed to it, however, universally regard the D. as one of the very finest fruits of the East. It brings a higher price than any other fruit in the market in India. It contains ten or twelve seeds, as large as pigeons' eggs, which, when roasted, are not inferior to chestnuts. One tree yields about 200 durians in a year.—The cultivation of the D. has not yet been successfully attempted in our hot-houses, the great size of the tree forming one principal obstacle to it. The D. is not a native of India, nor of Ceylon, but is now successfully cultivated in the latter country.

**DU'RLACH**, an old town of Germany, in the grand-duchy of Baden, is situated on the river Pfinz, at the base of the Thurmberg, a highly cultivated hill, three miles east of Carlsruhe. D. has manufactures of linen, tobacco, chicory, vinegar, as also important fruit and grain markets. The environs are covered with orchards. On the summit of the Thurmberg are the ruins of an old castle. D. is a station on the Manheim and Basel Railway. Pop. 5000.

**DU'RRA, DOURA, DURRA MILLET, INDIAN MILLET**, or **SORGHO GRASS** (*Sorghum*), a genus of grasses, distinguished from *Andropogon*—in which many botanists prefer to include it—only by the ovate or oblongo-ovate hermaphrodite spikelets, with glumes that have three small teeth at the extremity. The species are generally annual, tall, broad-leaved grasses, having strong culms filled with a juicy and saccharine pith, and large panicles. Several of them are cultivated as corn-plants, chiefly in Asia and Africa, particularly the common D. (*S. vulgare*, or *Andropogon Sorghum*, *Holcus Sorghum* of the older botanists), also called *Joar* and *Jowaree* in India. It grows 4—8 feet high, with thickly crowded panicles. It is a coarse, strong grass; its grain is round, a little larger than mustard seed. It is a native of the East Indies, is extensively cultivated in Asia, and may perhaps be described as the principal corn-plant of Africa. It is also cultivated to a considerable extent in the south of Europe. It is sometimes cultivated in Germany, but the summer is not sufficiently long and warm to secure its greatest perfection. The climate of Britain is still less suitable. D. yields a very abundant produce, in this respect even rivalling maize, but the meal does not make good bread; it is excellent, however, instead of rice for puddings, and is prepared in various ways for food. The culms and leaves, although coarse, are excellent food for horses and cattle, as is also the grain.—The seeds of the Shaloo or Sugar-grass (*S. saccharatum*) are more pleasant to the taste than those of the common durra. It is cultivated in the warm parts of Asia and in Africa, and has a diffuse and very spreading panicle. The sweet pith of the culm is eaten, and is also of value as a source of sugar. This plant has been cultivated to some extent in the Veronese, and its cultivation has been recently introduced into North America—where it is called Chinese Sugar-cane—in order to the production of sugar. It seems likely to form an important new feature in American agriculture, succeeding well at least as far north as Maine, and yielding sugar in large quantity. In Britain, it succeeds only in the warmest parts. As a forage plant, it is very nutritious when young.—Kafir Corn (*S. Caffrorum*) has a very diffuse umbel-like panicle, with branches bending down all around. The culm is more than the height of a man, and has a sweet pith. This species is largely cultivated in South Africa, both by Kafirs and by the colonists. By the latter, the grain is chiefly used for feeding horses.—*S. Halepense* is a troublesome weed in the fields of the north of Italy, like couch-grass. The sweet runners of the roots are kept by the apothecaries of that country as a substitute for sarsaparilla, under the name of *Garmignone*, or *Smilace dolce*.

**DU'RRENBERG**, a small town of Prussian Saxony, five miles south-east of Merseburg, deserves mention only for its salt springs, which produce about 250,000 bushels of salt annually. Pop. upwards of 300.

**DÜ'RRENSTEIN**, a village of Lower Austria, is situated in a highly picturesque locality, on the left bank of the Danube, about 45 miles west-north-west of Vienna. It is chiefly notable for the ruins of a castle, which stand upon a ridge of bare rock overlooking the town. A peculiar interest attaches to this grand but desolate and shattered fortress, from its having been the prison in which Richard Cœur-de-Lion was confined by Leopold of Austria, for fifteen months. Pop. 500.

**DU'RSLEY**, a town in the west of Gloucestershire, amid picturesque scenery, at the base of a steep beech-covered hill, and near the Coteswold hills, 15 miles south-south-west of Gloucester. It is irregularly built, and chiefly consists of three streets, diverging in different directions from the market-place. Pop. (1861) about 2500. In the oolitic and lias formation in the vicinity is a quarry of tophies or puffstone, which is a soft and easily worked stone, but hardens on exposure to the air.

**DUSICYON**, a genus of *Canidæ*, or sub-genus of *Canis* (Dog), consisting of a number of South American species or varieties, sometimes called Aguara Dogs. They have the body rather long in proportion to their height, and of considerable bulk, the muzzle rather sharp, eyes somewhat oblique, and aspect somewhat foxlike, the tail also has a more or less perfect foxlike brush. They are more diurnal than nocturnal in their habits, live in burrows, and feed on birds and small quadrupeds. Some of them have been domesticated by the Indians.—Akin to the Aguara Dogs, but more foxlike, are the Aguara Foxes (CERDOCYON, q. v.).

**DUSKY BAY**, a large inlet on the south-west coast of Middle Isle, in New Zealand, is in lat. 45° 40′ S., and long. 166° 20′ E. It was entered by Cook in 1769, who here found good anchorage.

**DÜ'SSELDORF**, the chief town of the district of Düsseldorf, in Rhenish Prussia, and the capital of the former duchy of Berg, is situated in the centre of a fertile district, on the right bank of the Rhine, at the confluence of the Düssel with that river, in lat. 51° 13′ N., long. 6° 45′ E. It was formerly fortified, but its ramparts were converted into gardens and promenades at the treaty of Luneville, 1802. It is seated in the midst of extensive garden-grounds, and is well built. The streets, the houses of which are built of brick, are regular and spacious; while the rows of trees with which many of them are planted, greatly enhance their appearance. D. is divided into the *Altstädt*, on the right bank of the Düssel; the *Karlstadt*, the handsomest quarter of the town, founded in 1786, by the Elector Karl Theodore, on the left side of the same stream; and the *Neustadt*, on the Rhine. A colossal equestrian statue of the Elector Johann Wilhelm, who founded a famous picture-gallery here in 1710—the pictures of which, however, were removed to Munich in 1808—stands in one of the five squares of Düsseldorf. The Düsseldorf Academy was founded in 1767, reorganised in 1822, and attained great eminence during the years 1822—1826, under the management of Cornelius and Schadow. The Art-Union for the Rhine Provinces and Westphalia was founded here in 1828. The principal buildings of D. are the old electoral palace; the present palace, the residence of the governor of the province; the government house, the observatory, town-hall (built in 1567), theatre, gymnasium, and public library. Of the ecclesiastical edifices, the most remarkable are the churches of St Andrew and St Lambert, and the church of the Jesuits, a handsome and highly ornate structure, having two steeples. The Hofgarten, one of the finest public gardens in Germany, is a very agreeable promenade. D. has manufactures of woollens, cottons, leather, hats, tobacco, jewellery, mirrors, &c.; but it may be said to derive its chief importance from its position on the Rhine, as on this account great quantities of goods are sent to D. from the surrounding districts for exportation. Its principal trade is in its manufactures, and in wines, spirits, iron-ware, &c. Pop. 46,849, most of whom are Catholics. Along with the duchy of Berg, D. came into the possession of Prussia in 1815. It was made a free port in 1829, and since that time it has prospered. It has daily communication with Mayence and Rotterdam by the Rhine steamers. Industry and commerce have likewise received a new impulse since D. became the central point of several lines of railway.

**DUST-BRAND.** See SMUT.

**DU'STEE**, the largest river of Beloochistan, enters the Arabian Sea, in lat. 25° 3′ N., and long. 61° 45′ E. In proportion to length, it is certainly the least considerable stream in existence. It is about 1000 miles long; and yet it has been found to be, at its mouth, 20 inches deep, and 20 yards wide. During its entire course, it is, in its permanent character, remarkably shallow; and, in fact, the water-courses of the country depend, without exception, almost exclusively on the rainy season.

**DU'STY-FOOT**, a court of summary jurisdiction established in fairs in England for the speedy determination of questions arising between those who resort to the fair. See PIED-POUDRE, COURT OF.

**DUTCH GOLD** is an alloy of copper and zinc, in the proportion of three or four ounces of zinc to one pound of copper. It can be beaten out into thin leaves resembling gold-leaf, when it receives the name of *Dutch gold-leaf*, and almost rivals gold in appearance. It is very liable to be tarnished by gases, such as hydrosulphuric acid (sulphuretted hydrogen), which are constantly present in the air, especially in town districts, and it may be distinguished from true gold-leaf by the action of strong nitric acid, which instantly dissolves Dutch gold, and leaves true gold unaffected.

**DUTCH LIQUID** is an oily substance obtained by mixing chlorine and olefiant gases, which combine together and yield D. L., with the formula $C_4H_4Cl_2$. It has a specific gravity of 1280 (water = 1000), boils at 184° F., is not miscible with water, but readily dissolves in ether and alcohol. It possesses the power of producing Anæsthesia (q. v.), just as Chloroform (q. v.) does; but the great difficulty of preparing D. L. in commercial quantities must retard its employment as an anæsthetic.

**DUTCH RUSHES.** See EQUISETUM.

**DUTENS**, LOUIS, a French writer, was born at Tours, 16th January 1730. Being a Protestant, he sought to make his way in England, and occupied himself at first in teaching and in self-improvement. At last, he accompanied the English ambassador to the court of Turin as his secretary, and afterwards remained as *chargé-d'affaires*, a position which he occupied twice subsequently. He held a pension, and was presented to the rich living of Elsdon, in Northumberland; and was likewise made Historiographer Royal of Great Britain. He died in 1812. His numerous works display great versatility and knowledge of the world. He undertook the first comprehensive, though not complete, edition of Leibnitz's works (6 vols., Geneva, 1769). In his *Recherches sur l'Origine des Découvertes attribuées aux Modernes* (2 vols., 1766), he rates the knowledge and invention of the ancients by far too high. The *Tocsin* (Rome, 1769), which afterwards appeared under the title of *Appel au Bon Sens* (Lond. 1777), contains some sharp attacks on Voltaire and Rousseau. There is considerable historical interest in his *Histoire de ce qui s'est passé pour le Rétablissement d'une Régence en Angleterre* (Lond. 1789). He also wrote several able treatises on numismatics and other subjects. In the *Considerations Theologiques sur les Moyens de réunir toutes les Eglises Chretiennes* (Par. 1798), he proposed that a council should compose a confession of faith grounded on the decrees of the councils of the first six centuries. His *Mémoires d'un Voyageur qui se repose* (Par. 1806) met with general favour.

**DUTROCHET**, RENÉ JOACHIM HENRI, an eminent French physiologist and physician, was born at the Château de Néon (Poitou), 14th November 1776, and came to Paris in 1802, to study medicine. His career as a student was brilliant, and in 1808 he was appointed military physician to Joseph Bonaparte, king of Spain. Soon after, he became physician-in-chief of the hospital of Burgos, then devastated by typhus fever. Returning to France in 1809, he gave himself up exclusively to the study of nature, and published a series of works on physics and physiology, full of new ideas. In 1819, he became a correspondent of the Royal Academy of Science; in 1823, of the Royal Academy of Medicine; and in 1831, a member of the former. He died 4th February 1847. The substance of all D.'s investigations and discoveries is contained in his *Mémoires pour servir a l'Histoire Anatomique et Physiologique des Végétaux et des Animaux* (Paris, 1837). He is best known by his researches on the passages of fluids through animal and vegetable substances. The passage of a fluid from without, inwards, he calls *endosmosis;* and from within, outwards, *exosmosis.* These terms have since been widely adopted by physiologists. See Diffusion of Liquids and Gases.

**DU'TTEEAH**, a city of Bundelcund, in Central India, lies between Agra and Saugor, being 125 miles to the south-east of the former, and 148 to the north-west of the latter. With a population of about 50,000, the place has many good houses, the residences of the principal zemindars or landholders of the neighbourhood. Like most towns in Bundelcund (q. v.), D. has a rocky site; and it is surrounded by a stone-wall 30 feet high. The lat. and long. are 25° 40′ N., and 78° 31′ E.

**DUTTEEAH**, the principality or raj of which the above-mentioned city is the capital, is a protected but not tributary state, extending in N. lat. from 25° 32′ to 26° 18′, and in E. long. from 78° 15′ to 78° 54′. It contains 850 square miles, and 120,000 inhabitants. The revenue is fully £100,000; and the armed force numbers 6000 men.

**DUTY.** See Ethics.

**DUYSE**, Prudens van, a Belgian writer, was born in Dendermonde, in Belgium, September 28, 1804. After completing his academical career, he was appointed Archivist of his native town, from which he was removed to the same office in Ghent. He soon afterwards received the office of Professor of National History in the Athenæum, and was made a member of various learned societies both in Belgium and France. He died November 13, 1859. D. was one of the chief contributors to the revival of Flemish literature. As a poet, he was less remarkable for genius than for prodigious fertility; his pieces all bear the stamp of improvisation, of which he was a great master. Several of his productions, both poetical and prose, obtained prizes from literary societies. Of 47 poetical publications issued by D. between 1836 and 1859, we may mention *Vaderlandsche Poëzy*, *Natalia*, *Elegiën*, *Gedichtjes voor Kinderen*, *Het Klaverblad*, and *Nieuwe Kindergedichtjes.*

**DWALE.** See Belladonna.

**DWARF.** See Giants and Dwarfs.

**DWARFED TREES**, growing in flower-pots, are a characteristic ornament of Chinese and Japanese houses and gardens, and the production of them is an art which has been carried to great perfection. It depends on the prevention of an abundant flow of sap, so that whilst the tree is kept living and healthful, vegetation does not go on with its natural activity. The trees are planted in shallow and narrow flower-pots; care is taken that their roots never pass into the ground beneath; they are very sparingly supplied with water; their strongest and leading shoots are pinched off, and their branches are bent and twisted in various ways. A very extraordinary dwarfing is the result of these and other such processes; and the dwarfed trees not unfrequently abound in flowers and fruit.

**DWA'RKA**, a maritime town of the province of Guzerat, in India, stands on the west side of the peninsula of Kattywar, being in lat. 22° 15′ N., and long. 69° 1′ E. It is one of the most sacred places in this part of Hindustan. On an eminence overhanging the sea-shore, which was once an islet, stands a great temple of Krishna, presenting to the mariner a conspicuous landmark; while, connected therewith by a colonnade, is a smaller edifice dedicated to Deoki, the mother of Krishna. The Gumti, a bordering rivulet which barely reaches the ankle, is, notwithstanding its insignificance, an object of profound veneration.

**DWIGHT**, Dr Timothy, a well-known American theologian, was born at Northampton, in Massachusetts, May 14, 1752; studied at Yale College, Newhaven; and was licensed to preach in 1777. During the War of Independence, he was for some time a chaplain in the American army. In 1783, he was ordained minister of Greenfield in Connecticut, where he also conducted an academy for twelve years with distinguished success. In 1787, the College of Princeton, New Jersey, conferred on him the degree of D.D.; and in 1795, he was elected President of Yale College and Professor of Divinity. He died January 11, 1817. D.'s principal work is his *Theology Explained and Defended in a series of* 173 *Sermons* (5 vols., Middletown, Conn. 1818, &c.). It has been frequently reprinted in England; and used to be—as probably it still is in quiet country quarters—very popular among elderly persons of a serious turn of mind. D. was not a great or original thinker; but his mind was fertile in the production of respectable ideas, which, though sufficiently commonplace, were yet pleasing both in themselves, and from the important nature of the subjects to which they referred. Among his other writings may be mentioned, *The Conquest of Canaan, an Epic Poem* (1785); *Travels in New England and New York* (1821), reckoned by Southey the most important of his writings; and two volumes of *Sermons* (Edin. 1828).

**DWI'NA**, Northern—as distinguished from the Western Dwina or Düna (q. v.)—an important river of Russia, has its origin in the confluence of the Suchona and the Jug, two streams, the latter more than 200 miles, and the former nearly 300 miles in length, rising in the south of the province of Vologda, and uniting in lat. 60° 45′ N., long. 46° 30′ E. The D., from the union of these streams, flows north for about 50 miles, and receives the Vytchegda from the east, a river 500 miles long. At this point, the D. becomes navigable, and here it alters its direction, and proceeds north-west toward the Gulf of Archangel, into which it flows, having been joined on the right by the Pinega, and on the left by the Waga, and having traversed a course of about 700 miles. The basin of the D. comprehends an area of 123,900 square miles. Its average width is from 500 to 600 feet; before debouching into the White Sea, however, its surface, which is there marked by many islands, increases in width to about four miles. The waters of the D., the largest river that falls into the White Sea, are abundantly supplied with fish. Vessels of more than 14 feet draught cannot enter the D., on account of the shoals at its mouth.

**DYCE**, Alexander, an English literary historian, was born at Edinburgh, 30th June 1798. He was educated at the High School of that city, and afterwards at Oxford. After officiating for some time as curate, he settled in London in 1827. His literary reputation is chiefly based on his editions of the older English poets and authors—George Peele, Robert Greene, John Webster, Shirley, Thomas Middleton, John Skelton (an author of the beginning of the 16th c., previously little known), Beaumont and Fletcher, and Marlowe, with biographies of the authors, and instructive notices. He also edited the poems of Shakspeare, Pope, Akenside, and Beattie, for Pickering's Aldine Edition of the Poets. An old play discovered by him, called *Timon*, and which may possibly have first suggested to the great poet the idea of his drama of the same name, was besides published for the Shakspeare Society, as well as another entitled *Sir Thomas More.* In conjunction with Collier, Halliwell, and Wright, he founded the Percy Society for the publication of old English ballads, plays, and poems. His ability as a commentator on Shakspeare is proved by his *Complete Edition of the Works of Shakspeare; the Text revised; with Account of the Life, Plays, and Editions of Shakspeare, Notes, &c.* (1858).

**DYCE, William**, R.A., a distinguished living painter, was born at Aberdeen. He was educated at the university there, and at the age of 16 obtained the degree of Master of Arts. After acquiring the rudiments of his art-education he went to Rome, and followed out his studies there for some years. His tendency at first was very strongly, and now is, under certain modifications, towards early Italian, or pre-Raphaelite art, and his productions attracted the marked attention of Overbech, the head of the modern German school. On his return to this country, he settled in Edinburgh, where, besides painting portraits, he contributed largely to the Exhibitions. The first picture he exhibited in Edinburgh was in the Perugino style, and though evincing great power, was at that period, 1829, but little felt or appreciated; his 'Puck,' however, exhibited at the same time, was very successful, and most of his after-contributions to the Exhibitions of the Royal Scottish Academy, of which he was a member, were deservedly popular, particularly his picture of 'Francisca da Rimini,' exhibited in 1837. After this he went to London, having been nominated to the head-mastership of the New School of Design at Somerset House, an office which he obtained on account of his general acquirements and knowledge of art, and which he held for three years. Soon after this he was appointed Professor of Painting in the London University. He distinguished himself at the Westminster competition by his frescoes, and in consequence was one of the artists selected to decorate the Palace of Westminster and the House of Lords, and at Osborne House several works in fresco have been executed by him. D. was elected an Associate of the Royal Academy in 1844, and Academician in 1848. The following are some of the works he exhibited in the Royal Academy: 'King Joash Shooting the Arrow of Deliverance,' a 'Madonna and Child' (1846), a 'Meeting of Jacob and Rachel' (1850), 'Christabel' (1855), 'The Good Shepherd' (1856), 'Titian Preparing to make his Essay in Colouring,' 'Neptune Assigning to Britannia the Empire of the Sea,' a study for a fresco at Osborne (1857), 'St John Leading Home his Adopted Mother,' 'The Man of Sorrows' (1860), and 'George Herbert at Bemerton' (1861).

**DYCK, Sir Anthony Van.** The history of this celebrated painter is of great interest, not only from the high position he held as an artist, but from his having settled in England, where he executed numerous works, which enable us to realise most of the personages whose actions form prominent points in the history of this country. He was born at Antwerp, 22d March 1599. His father, according to Houbraken, was a glass-painter; and it is said that his talent was fostered by his mother, who painted landscapes, and was skilful in embroidery. After making very considerable progress under Van Balen, he was, in 1615, admitted as a pupil of Rubens, who was not slow to appreciate his great talents. In a letter, dated 17th July 1620, addressed to the Earl of Arundel, known historically for his patronage of art, the writer states, 'Van Dyck lives with Rubens, and his works are beginning to be esteemed little less than those of his master. He is a young man of one-and-twenty, whose parents are persons of considerable property, and it will be difficult, therefore, to induce him to remove.' Soon after this—namely, in 1621—by advice of Rubens, he visited Italy. The works of the great Venetians were the first to attract his attention. After leaving Venice, Genoa was the next city he resided in, then Rome, and he went a second time to Genoa, from whence he made a short visit to Palermo. Van Dyck was five years in Italy, and from the number of portraits painted by him in Genoa—many of the best of his works in his Italian manner are still there—he must have lived a considerable portion of the time in that city. On his return to Antwerp in 1626, he executed various pictures for churches, and the portraits classed among those painted in his Flemish style; the series of cabinet portraits of the painters of his day, engraved by Vostermans, &c., and most of which are now in the possession of the Duke of Buccleuch, were also painted at this time. It is stated, that about 1630—1631, Van Dyck visited England, and, meeting with no encouragement, remained only a short time; however, there is no satisfactory proof of this. But in 1632, he came to England, by invitation of the Earl of Arundel, at the command of Charles I. He was lodged at Blackfriars, was soon afterwards knighted, and had a pension of £200 a year settled on him. His commissions were now numerous, he was enabled to live in great style, entertained people of high rank, and had a country-house at Eltham, in Kent. His wife, Marie Ruthven, by whom he had one daughter, was the daughter of Patrick Ruthven, physician, fifth son of Lord Gowrie. Van Dyck died in London in 1641, leaving property to the amount, it is said, of about £20,000. Only twenty years are included within the time when Van Dyck left the studio of Rubens till the period of his death; and during that short career, the number of pictures executed by him, on what is thought to be good authority, seems almost incredible, for in Smith's Catalogue Raisonné of the Works of the Dutch and Flemish Painters, there are descriptions and interesting particulars of upwards of 950. This artist's works may be classed as executed in three distinctly marked styles—1. Those painted in Italy during his residence of five years, from 1621 till 1626; these are distinguished by deep tone and colour, and dignity of character and expression. The portraits of the Lomellini Family and an Italian Nobleman, in the Scottish National Gallery, are good examples of his style at this period. 2. His productions between 1626 and 1631, when he lived in Flanders, are known as done in his Flemish style; these works are executed with much *impasto* or body of colour in the lights, and transparency in the shadows. Perhaps it was during this period of his career that he executed his finest works, among which the best are the portrait of Snyders the painter, now the property of the Earl of Carlisle; the companion-picture of Snyders's wife, now belonging to the Earl of Warwick; and the portraits of Philip le Roy and of his wife Madame le Roy, purchased by the Marquis of Hertford at the sale of the king of Holland's pictures. 3. The portraits he painted in England between 1631 and 1641; these are noted for grace and elegance, but many of them were often slight in execution, or done partly by assistants. Van Dyck's biographers and critics generally dwell at great length on his Scripture subjects, and express regret that he devoted so much of his time to portrait-painting; but different notions seem to be now gaining ground. No Scripture subjects by Rubens or Van Dyck, or produced in any of the later schools, will stand comparison, for purity of feeling and appropriate technical execution, with the works of the earlier masters; and the allegorical pieces so much in vogue in the 17th c., are little in accordance with the ideas of the present time. But the portraits by Van Dyck are all interesting and valuable histories, recorded with marvellous truth and vividness, of characters who played important parts in an era noted for great events—and as works of art will rank with the productions of the best schools.

Van Dyck's etchings are admirable. Several of the portraits in the collection of portraits of artists, are etched by him. The impressions of those that were thrown off, when the heads merely were etched, are of great value; indeed, in expression and spirit, they have never been equalled.

**DYEING** is the art of staining or colouring yarn or cloth. It has been practised among eastern nations from time immemorial; and in the sacred writings, we read of the vestments of the high-priest being dyed purple, of linen cloths being dyed blue, purple, and scarlet, and of rams' skins being dyed red. The famous Tyrian purple is believed to have been discovered by an inhabitant of Tyre fifteen hundred years B.C.; and immediately afterwards the Tyrian purple became the badge of royalty, and cloth dyed with it commanded a princely price. The Egyptians, Greeks, and Romans practised the art of dyeing; and gradually it became more and more wide-spread as civilisation advanced, the discovery of America and other lands materially increasing the number of dye-stuffs. In earlier times, dyeing was much more extensively followed as a domestic art than it is at the present time. In the Highlands of Scotland, however, females are still in the habit of dyeing cloth *brown* by immersing it in a solution of copperas (sulphate of iron), and then treating it with a decoction of sumach, logwood, and crottel (*Parmelia omphalodes*), a lichen which covers many rocks and trees in moist situations; *black*, by immersing the cloth or yarn in an infusion of the bark of the alder-tree (*Alnus glutinosa*), along with copperas and a little sumach; *yellow*, by the common heather (*Calluna vulgaris*) and alum; *red*, by the roots of bed-straw (*Galium verum*) and alum, &c.

The Dye-stuffs (q. v.) employed in the various processes of dyeing are numerous, and when two or more are associated together, many different shades and colours are produced besides the original colour yielded by each. The dyeing materials are procured from the mineral, vegetable, and animal kingdoms, and are often very costly. The arrangements connected with dyeing operations are at times simple, whilst at other times they are complex, and require the greatest care and skill on the part of the dyer. In communicating the deep indigo blue to woollen cloth and yarn, a vat is taken, about 6 or 7 feet in diameter, and 8 to 9 feet in depth, and nearly filled with water, along with 18 to 22 lbs. of indigo, 10 to 20 lbs. of madder, 7 to 9 lbs. of bran, and generally 7 to 9 lbs. of woad. After the requisite boiling, and the addition of 7 or 8 lbs. of lime, to form an alkaline liquid in which the indigo can be held in solution, the whole is well closed over with tightly fitting wooden covers; and in a day, the putrid fermentation of the woad and bran proceeds, the result of which is to abstract the oxygen from the blue indigo, the colour of which is gradually reduced till it assumes a yellowish colour, and the solution then contains indigo white. If woollen yarn or cloth is now dipped in this liquid, it comes out of a yellow tint, from the attachment of the white indigo solution; but when exposed to the air, the oxygen immediately begins to act upon the white indigo, combining with it, so as to form oxidised or blue indigo, and as the process of oxidation proceeds, the yarn or cloth becomes first of a greenish and then of a blue colour. If the cloth be again soaked in the yellowish solution, and subsequently exposed to the air, the depth of the blue colour may be increased step by step, till it arrives at that deep shade of blue so well known, especially in the coarser qualities of woollen cloth. In the dyeing of cotton with indigo, the vat is prepared differently. The indigo is first ground into a thin paste with water, and afterwards placed in a vat with protosulphate of iron and milk of lime. The lime ($CaO$) takes the sulphuric acid ($SO_3$) from the sulphate of iron ($FeOSO_3$), forming sulphate of lime ($CaOSO_3$), and liberating protoxide of iron ($FeO$), which immediately abstracts the oxygen from the blue indigo, reducing it to white indigo, and the latter dissolves in the excess of lime present in the vat, yielding a colourless solution. When cotton cloth or yarn is dipped in this, it comes out of the vat almost colourless; but on exposure to the air, the indigo becomes reoxidised, and the cloth passes to a green, and ultimately to a deep-blue shade. The cloth or yarn is then washed in water, and afterwards soaked in very dilute sulphuric acid, to remove any oxide of iron remaining attached, and rewashed in water, when the blue colour becomes more bright and clear.

In the fixation of colour upon cloth, recourse is often had to a mordant (see CALICO-PRINTING), which acts as a middle agent, and attaches the colour to the cloth. The principal mordants are alum, cream of tartar, and salts of tin. Previous to the application of any colour, the cloth or yarn must be well cleansed from grease, oil, &c., by scouring in soda or in soap, and except where the material is to be dyed of a dark colour, the goods are also subjected to the process of bleaching. In the case of fabrics which require a smooth surface, the preliminary operation of singeing off the loose hairs is resorted to. See CALICO-PRINTING.

DYEING OF COTTON.—The following receipts for the dyeing of cotton apply to 10 lbs. weight of cotton yarn or cloth, which is found to be the smallest quantity capable of being well dyed at one time. The proportions of each ingredient may be altered, however, so as to correspond with the quantity of cloth or yarn to be operated upon.

1. *Common Black.*—Take 3 lbs. sumach, and treat with hot water; steep the goods in the hot decoction for some hours; wring out; wash for 10 minutes in lime-water, and for 30 minutes in a solution of 2 lbs. copperas. Wash the goods well in cold water, sometimes repeating the treatment with lime, and rewashing; then work the goods for 30 minutes in a warm solution of 3 lbs. of logwood, and afterwards with 2 oz. copperas; work again for 10 minutes; wash, and dry.

2. *Jet Black.*—Proceed as at 1, adding 1 lb. of fustic with the logwood; and when 3 pints of iron liquor are used instead of the 2 oz. copperas, a more brilliant black is obtained.

3. *Blue Black.*—Use the indigo blue vat, and then proceed as at 1.

4. *Brown.*—Treat the goods with a yellow dye; then work for 30 minutes in a decoction of 2 lbs. lima wood and 8 oz. logwood; lift and work with 2 oz. alum for 15 minutes; then wash, and dry.

5. *Catechu Brown.*—Immerse the goods at a boiling temperature in a decoction of catechu; then work for 30 minutes in a hot solution of 6 oz. bichromate of potash. Wash in hot water, and if the latter contain a little soap, the colour will be improved.

6. *Chocolate or French Brown.*—Dye the goods with a spirit yellow; then treat for half an hour with a solution of 3 lbs. of logwood; raise with a little red liquor; work for 10 minutes; wash, and dry.

7. *Red.*—Make a hot solution of 3 lbs. of sumach; introduce the goods, and let stand till the liquor is cold; then wring out, and work in water containing in each gallon a gill of red spirits (prepared by adding 2 oz. of feathered tin by degrees to a mixture of three parts of hydrochloric acid, one part of nitric acid, and one of water in the cold) for 30 minutes; wring and wash well; then work the goods for 30 minutes in a lukewarm decoction of 3 lbs. of lima wood, and 1 lb. of fustic; add a gill of red spirits; work the goods longer; wash, and dry. The famous Turkey-red is imparted to the cloth by first impregnating it with an oily or fatty substance, and then subjecting it to a decoction of madder. It is one of the most durable of all colours.

8. *Yellow or Straw.*—Work the goods in a weak solution of acetate of lead; then wring out, and work in a dilute solution of bichromate of potash; wring out, and work again in the lead solution; wash, and dry.

9. *Leghorn Yellow.*—Proceed as at 8, but add a little arnotto liquor with the solution of bichromate of potash.

10. *Spirit Yellow.*—Work the goods through a weak solution of protochloride of tin for 30 minutes; then work in a solution of quercitron bark for 15 minutes; lift out, and work again in tin solution, and wash in cold water.

11. *Orange.*—Proceed as at 8, and afterwards pass through lime-water at the boiling-point, ultimately washing in cold water.

12. *Blue.*—The goods are worked in various strengths of solutions of salts of iron, such as nitrate of iron; wring out; wash in water, and then work in solution of yellow prussiate of potash; wring out, and wash in water containing a little alum. The various shades of blue may be obtained by using stronger or weaker solutions.

13. *Green.*—Dye the cloth blue; then work in red liquor (acetate of alumina); wash in water; work in decoction of fustic or bark; raise with solution of alum; wash in cold water, and dry. The darker shades of green, as olive or bottle green, are brought out by the use of sumach and logwood along with the fustic.

14. *Puce or Lilac.*—Work the cloth or yarn in red spirits (see 7), then in logwood solution at a temperature of 140° F., adding a little red spirits, red liquor, or alum; wash, and dry; or dye the cloth blue (12); then work in solution of logwood; add alum; work again; wash, and dry.

15. *Purple.*—Soak the goods in a warm decoction of sumach till cold; work for an hour in red spirits; wash; work in hot solution of logwood; then add a little red spirits, and work again; wash, and dry. The various shades of purple may be obtained by altering the strength of the chemicals; the more sumach, the browner the hue, and the more logwood, the bluer the purple becomes.

16. *Lavender or Peach.*—Work the goods for 20 minutes in spirit-plumb (a strong solution of logwood, treated with about one-sixth of its volume of a solution of tin, made by dissolving tin in six or seven parts of hydrochloric acid, one part of nitric acid, and one of water); wring out, and wash well in cold water.

17. *Safflower Lavender* is obtained by dyeing the goods a light-blue, then working in decoction of safflower, which places a pink on the top of the blue.

18. *Drab.*—Work the goods in a decoction of sumach; lift, add copperas; rework; wash in water; then work in a mixed decoction of fustic, lima wood, and logwood; raise with a little alum; wash, and dry. Catechu is occasionally employed.

Dyeing of Wool.—In the dyeing of woollen yarn and cloth, the various steeps are used warm, but the washings in water are done cold. Care must be taken to remove every particle of grease from the wool by washing with soda and soap, before it is subjected to the process of dyeing, else the colouring matters will not adhere. The more common and important colours are obtained as follows:

19. *Black*—by working the cloth in a bath of camwood, then of copperas; after which wash out; then treat with decoction of logwood and copperas: or work in a bath of bichromate of potash, alum, and fustic; lift, and expose to the air; then immerse in decoction of logwood, barwood, and fustic; thereafter of copperas.

20. *Brown.*—The goods are worked in a bath of fustic, madder, peachwood, and logwood; then introduce into dilute solution of copperas: or the goods are treated with a bath of bichromate of potash, argol, and alum, washed, and then introduced into a bath of fustic, madder, peachwood, and logwood.

21. *Red*—by working in a decoction of bichromate of potash and alum, and subsequently in a bath of peach or lima wood, with a little alum. Scarlet is obtained from cream of tartar, cochineal, sumach, and fustic.

22. *Crimson*—from cochineal, cream of tartar, and chloride of tin. Cudbear gives a wine tint.

23. *Pink.*—Work the goods in a bath of tartar, alum, cochineal, and red spirits.

24. *Orange*—from a bath of sumach, cochineal, fustic, tartar, and red spirits.

25. *Yellow*—from a bath of tartar and alum; then a decoction of bark, sumach, fustic, and red spirits.

26. *Blue.*—Various shades may be obtained from immersion in salts of iron, and then in solutions of yellow prussiate of potash (see 12). Also work the wool in a bath of argol, alum, and indigo extract.

27. *Green.*—Work the goods in a bath of fustic, argol, and alum, and thereafter in a solution of indigo. The dark shades of green, such as olive, are brought out by a bath of fustic, logwood, madder, and peachwood, and afterwards of copperas.

28. *Violet*—from cudbear, logwood, barwood, or camwood, and peachwood; as also alum. The addition of copperas brings out a puce tint.

29. *Drab.*—The manifold shades of this colour are procured from variable strengths of decoctions of madder, peachwood, logwood, fustic, associated with alum and copperas.

Dyeing of Silk.—The operations connected with the dyeing of silk are similar to those already sketched out, but a more thorough scouring of the raw material requires to be made, so as to remove all the gum and wax belonging naturally to the fibre.

30. *Black* is obtained by working the silken material in copperas (sulphate of iron), then in logwood containing some chamber liquid, and repeating the treatment with copperas and logwood till the requisite shade is procured. A little nitrate of iron tends to give a more full, deep black; and alum and white soap are also used with advantage. Acetate of copper is occasionally used.

31. *Blue Black.*—Dye a blue as at 12, and then proceed as at 30.

32. *Brown.*—Obtain an orange by immersion in a solution of annotta, then treat with copperas; and introduce into a bath of fustic, logwood, archil, and a little alum. If a more yellow tint is required, add more fustic; redness is obtained by adding peachwood, and blueness by the addition of logwood.

33. *Reds* are obtained from peachwood and fustic, and thereafter red spirits. Annotta is used in getting up the scarlet shades, and cochineal and safflower in the more expensive red dyes. Rubies and maroons require cudbear.

34. *Pink*—from safflower, associated with sulphuric acid and cream of tartar.

35. *Orange and Yellow*—by treating the goods with more or less strong solutions of annotta, associated with alum and white soap.

36. *Blue*—from salts of iron and yellow prussiate of potash; or from solutions of sulphate of indigo, assisted with a little alum.

37. *Green*—from steeping in decoctions of fustic and sulphate of indigo, along with a little alum. The darker shades have copperas added and logwood.

38. *French and Pearl White.*—Work the silk in a lather of white soap, to which archil or cudbear has been added, to give the required shade.

39. *Drab*—from decoctions of sumach, fustic, logwood, and more or less copperas, according to the depth of shade required.

DYEING OF MIXED FABRICS.—The coloration of textile fabrics composed of more than one kind of material, generally requires two or more processes, as the plan pursued in dyeing wool is seldom capable of fixing the colour upon cotton. The customary plan followed is to immerse the fabric in the requisite baths, to dye the wool, and then to treat the partially dyed material in the manner found suitable for cotton. Occasionally, the woollen thread of the cloth is dyed of one colour, and thereafter the cotton is treated so as to acquire a different shade or colour. The producing of a coloured pattern on cloth has already been considered under CALICO-PRINTING.

**DYER**, GEORGE, an antiquary and scholar of some eminence, was born in London, March 15, 1755, and was educated first at Christ's Hospital, and afterwards at Emanuel College, Cambridge, which he entered in 1774, and where, after four years' study, he took his degree of B.A. During the next fourteen years, he was variously engaged, chiefly at Cambridge, as usher, tutor, and as minister (in the Baptist denomination), but he finally settled in London in 1792. Here he devoted himself principally to literature, and produced, among many works of less note, the *History of the University and Colleges of Cambridge* (Lond. 2 vols., 1814), and *Privileges of the University of Cambridge* (Lond. 2 vols., 1824). He also contributed largely to magazines. He died in London in 1841. D. was a man of remarkable straightforwardness and honesty of character, qualities which are everywhere discernible in his works. He was also a poet, although now forgotten, and never famous.

**DYER**, REV. JOHN, an English poet, was born at Aberglasney, in Caermarthenshire, in the year 1700, and educated at Westminster School. He was intended for the law, but, however, abandoned that study for painting. In 1727, he published his poem of *Grongar Hill*, remarkable for simplicity, warmth of feeling, and exquisite descriptions of nature. He then made the tour of Italy, and returning home in bad health, took orders, and obtained some respectable ecclesiastical preferment. In his didactic poem, entitled *The Fleece* (1754), the difficult subject is treated with great success; but the unpretending tone of the poem made no impression upon his contemporaries. Another poem, *The Ruins of Rome* (1740), abounds in isolated beauties. D. died in 1758. A collected edition of his poems appeared in 1761.

**DYE'-STUFFS.** The substances used in dyeing as the sources of colouring matter, are mostly derived from the vegetable and animal kingdoms, the far greater number of them from the former. To the animal kingdom, and to the class of Insects, we are indebted for *Cochineal*—and consequently for *Carmine*—*Kermes*, and *Lac*, and less directly for *Galls.* The *Tyrian purple* of the ancients is also said to have been a product of the animal kingdom, obtained from a mollusc.—The dye-stuffs obtained from the vegetable kingdom are numerous, and in every part of the world there are some in domestic use, which have not become articles of commerce. Such are those dye-stuffs of the Highlands of Scotland, mentioned in the article DYEING. Dye-stuffs are procured from plants of widely different natural families: there are some indeed in which certain colouring matters appear to be extensively prevalent, as in *Rubiaceæ* (madder, &c.), and the genus *Cæsalpinia* (q. v.). They are also obtained from almost all different parts of plants, as the heart-wood (*duramen*) of the stem (Logwood, Brazil-wood, Camwood, Fustic, &c.); the bark (Alder, &c.), the root or its bark (Barberry root, &c.); the leaves and other herbaceous parts (Indigo, &c.); the corolla (Safflower); the fruit (French Berries, Annotta, &c.) The principal dye-stuffs are the following: *Alkanet* (q. v.), useful in dyeing various shades of lilac, lavender, and violet, which are, however, liable to fade on exposure to light. *Aloes*, obtained by evaporating the juice of the aloe, which is grown in the East and West Indies, Sicily, Italy, and Malta. It contains a brown colouring matter named *Aloetin*, which may be employed in the production of a brown tint. *Arnotto* (q. v.), employed in imparting the various shades of yellow, orange, and scarlet, to silk, wool, and cotton. *Archil*, yielding, when infused in water, a crimson dye of great beauty, though fugitive, and used in giving a finish to wool and silk which have been previously dyed. *Barberry root*, imported from the East Indies, and containing a yellow colouring matter called *berberin*. *Brazil-wood*, often called *peach-wood*, containing *brazilin*, which, in contact with the air, yields a rich red colour. *Camwood* (q. v.) or *Barwood*, has a red colour similar to that of Brazil-wood, is generally employed in the form of a coarse powder, and readily imparts its colour to water. *Catechu*, yields a reddish-brown solution in water, and performs an important office in the dyeing of many shades of brown, black, and green. *Chica* (q. v.), employed in the dyeing of wool and cotton of an orange-yellow colour. *Cochineal*, employed directly, or indirectly in the form of carmine (extracted from the cochineal), in imparting the most beautiful red and crimson colours. *French, Persian, Turkey*, or *Spanish berries*, obtained from several species of *Rhamnus* (see BUCKTHORN), yield a powerful yellow dye. *Fustet*, the finely divided wood of *Rhus cotinus* (see SUMACH), a yellow dye. *Fustic* or *yellow wood*, used for dyeing cloth yellow, and for communicating a good green tint to cloth already rendered blue; as also, in conjunction with other dyes, in imparting various shades of drabs, olives, fawns, &c. *Galls* or *gall-nuts* are employed in dyeing cloth of a dark or black colour. *Indigo* (q. v.), very extensively used in the dyeing of yarn and cloth of a deep blue colour, which may be afterwards rendered green by a yellow dye. *Kermes, Kermes grains*, or *Alkermes*, an excellent material for dyeing many shades of red, and one of the most ancient dye-stuffs employed in the colouring of silk. *Lac* (q. v.), *Shell-lac*, or *Stick-lac*, is used in the preparation of red dyes. *Logwood* (q. v.), broken up into small chips, or reduced to powder, is employed in the dyeing of reds, and, when associated with other substances, yields purples, violets, and blues. *Madder* (q. v.), one of the most important of dye-stuffs, is extensively used in the dyeing of cloth and yarn red, purple, brown, &c. *Munjeet* or *Indian madder* is used in India instead of madder. *Quercitron* yields a rich orange-yellow, or yellow-red dye, capable of being afterwards made a brown; and when used after a blue dye, it changes the latter to a bright green. *Safflower* yields a rich yellow dye. *Sandal-wood*, *Santal* or *Saunders wood*, yields a red colour, which, along with other substances, may be altered to violet, reddish brown, and scarlet. *Sumach*, occasionally called *young fustic*, is employed as a yellow dye, and also for the tannin and gallic acid it contains, which enables decoctions of sumach to be used with great effect for imparting depth or solidity to other colours. *Turmeric*, or *Indian saffron*, is employed as a yellow dye, but is very fugitive. *Weld*, or *Wold*, produces a rich but fugitive yellow. *Woad* is employed as a blue dye for woollen and silk yarn and cloth, either with or without indigo. *Wongshy* is a new yellow dye-stuff procured from the seed-vessels of a plant belonging to the family of *Gentianeæ*, and imported from Batavia.

The above list of dye-stuffs comprehends those which are obtained, directly or indirectly, from the vegetable and animal kingdoms; and a more lengthened notice of the substances will be found under their respective names. Other dye-stuffs less generally used are also noticed in the articles devoted to different orders and genera of plants. The metallic salts and compounds employed in dyeing will be specially noticed under the various metals; thus for acetate of lead, see LEAD; sulphate of iron, see IRON; &c.

COAL-TAR COLOURS.—The most recent discovery of importance in dyeing, is the extraction of coloured substances of great beauty from coal-tar, and the application of these to the colouring of cloth. At the present time (1861), these dyes of coal-tar origin are most extensively employed, and give rise to the fashionable colours named Aniline purple, Tyrian purple or Mauve, Violine, Roseine, Fuchsine or Magenta, Solferina, Bleu de Paris, Aniline green or Emeraldine, Azuline, &c. It is only, however, within the last four years that these dyes have become practically known, though the preliminary discoveries in connection with their extraction were made in 1826. The condensable product or gas liquor obtained during the destructive distillation of coal in gas-works, consists of aqueous matter holding salts of ammonia in solution, and tar with naphtha. The tar consists of a numerous class of bodies, of which aniline and benzole are two. The aniline is present in minute quantity; and for manufacturing purposes, means are generally resorted to for the conversion of the benzole of gas-tar into aniline. The process followed on the commercial scale is to act upon the benzole by nitric acid, by which it is converted into nitro-benzole, and thereafter, by the action of acetate of the protoxide of iron, it becomes aniline.

*Aniline Purple.*—In the preparation of the dye known as aniline purple, solutions of equal equivalents of sulphate of aniline and bichromate of potash are mixed together; and when the reaction is complete, a black precipitate is obtained, which is dried, and then digested several times in coal-tar naphtha, to separate all resinous matter. The residue is dissolved by successive quantities of alcohol; and the solution being placed in a retort, the alcohol is distilled off, and the aniline purple is left as a beautiful bronze-coloured substance. Aniline purple is slightly soluble in cold water, more so in hot water, and is readily dissolved by the alcohols and aniline itself. It is nearly insoluble in ether and naphtha.

*Roseine* is most readily prepared on the commercial scale by adding two equivalents of binoxide of lead to a boiling solution of one equivalent of sulphate of aniline, and boiling the whole for a short time. On filtration, a rose-coloured solution is obtained, which is evaporated down to small bulk, when some resin separates, and the roseine is precipitated by soda or potash, and being collected on a filter, can be washed and dried. This dye is readily soluble in alcohol, and yields a very intense crimson colour, which, on being evaporated to dryness, leaves a dark metallic-looking and brittle residue of roseine. It is soluble in water, but not in naphtha.

*Violine* is procured by the oxidation of aniline, and the process generally followed is to heat a mixture of two equivalents of sulphuric acid, one equivalent of aniline, and some water, to the boiling-point, then add binoxide of lead, boil for some time, and filter hot. A purple liquid is obtained, which is boiled with potash till the aniline present is volatilised, and the colouring matter is precipitated, when the latter is thrown on a filter, washed with water, and dissolved in a dilute solution of tartaric acid. On filtration, the coloured liquid is evaporated to small bulk, refiltered, reprecipitated by potash and soda, and the precipitate being dissolved in alcohol, yields an alcoholic coloured solution, which on distilling off the alcohol, leaves the violine as a brittle bronze-coloured substance. Violine is very slightly soluble in water, is readily dissolved by alcohol, and is insoluble in ether and naphtha.

*Fuchsine* or *Magenta* is prepared by adding anhydrous bichloride of tin by degrees to aniline. The materials are constantly stirred during the operation, to keep down the intensity of the action, and the result is, that much heat is evolved, the mixture becomes pasty, then liquid and brown; and as the temperature approaches the boiling-point, it becomes a dark, almost black liquid, which in very thin layers presents a rich crimson colour. This liquid is boiled for some time, much water added, the whole reboiled, so as to volatilise any free aniline, and chloride of sodium (common salt) added till saturation, when the fuchsine or magenta is precipitated as a golden green, semi-solid, pitchy substance. Any resinous matter still remaining may be separated by digestion in benzole. This dye may also be obtained by acting upon aniline with nitrate of mercury. Fuchsine or magenta is sparingly soluble in water, dissolves to some extent in alcohol, and is insoluble in ether and naphtha.

*Bleu de Paris* is prepared by heating 9 parts by weight of bichloride of tin and 16 parts of aniline to a temperature of about 350° F., in a sealed tube, for 30 hours, when a blue product is obtained, which is soluble in alcohol, and crystallises therefrom in fine needles of a lively blue colour. Bleu de Paris is soluble in water, alcohol, wood-spirit, and acetic acid, and insoluble in ether and bisulphuret of carbon.

*Aniline Green* or *Emeraldine* is obtained by acting upon a hydrochloric acid solution of aniline by chlorate of potash, when the aniline becomes oxidised, and yields a dull green precipitate, which on drying becomes an olive-green residue. It is insoluble in water, alcohol, ether, and benzole, and in the presence of a free acid the green colour improves in appearance, though it returns to its original shade when the free acid is removed.

*Quinoline* or *Chinoline* is present in coal-tar, and may be employed to yield three colouring matters—a violet, a blue, and a green; but the processes as yet followed in their preparation belong more to the laboratory experiments of the scientific chemist than to the practical operations of the manufacturer.

*Picric Acid* is obtained by acting upon many organic substances, such as indigo, aniline, carbolic acid, salicin, silk, aloes, gum-resins, &c., by nitric acid. On the commercial scale, carbolic acid is generally employed, and it is first treated with nitric acid of slightly less density than 1300 (water = 1000), and afterwards boiled with stronger acid, when it passes into picric acid, and is precipitated on dilution with water. It can be purified by recrystallisation from boiling water. Pure picric acid crystallises in lamina of a primrose yellow colour.

*Azuline* is the only other colouring matter of practical importance derived directly or indirectly from coal-tar. It is a brittle, non-crystallisable substance, with a copper-coloured metallic appearance. It is sparingly soluble in water, but is soluble in alcohol, yielding a fine blue solution with a shade of red. Treated with concentrated sulphuric acid, it becomes a fine blood-red liquid, which, on dilution with much water, gives a red precipitate of azuline.

*Pittacal* is a blue colouring matter obtained from coal-tar.

*Dyeing of Silk and Wool by the Coal-tar Colours.*—This department of the operations of the dyer is very simple, as the silk and wool fibres possess the power of taking up and fixing the majority of these colouring matters with great rapidity, whenever the yarn or textile fabric is placed in the vessel containing a solution of the colour. In the dyeing of silk with aniline purple, violine, and roseine, the alcoholic solution of the colour is diluted with eight times its volume of hot water acidulated with tartaric acid, and thereafter treated with a larger quantity of cold water. The silk is merely worked in this comparatively weak solution of the dye till the shade of colour is deep enough. The addition of a little sulphate of indigo to the dye-vat assists in bringing out a more decided blue tint. The same result is obtained by first dyeing the goods with Prussian blue before immersion in the coal-tar colour. When silk is to be dyed with fuchsine, picric acid, chinoline blue or chinoline violet, the goods require only to be worked in water-solutions of these colours. A little acetic acid added to the vat containing the fuchsine or picric acid is advantageous, and if a solution of sulphate of indigo is mixed with the solution of picric acid, the goods acquire a fine green colour.

Azuline is attached to silk with more difficulty than any of the preceding colours. The silk requires to be worked first in a solution of azuline acidulated with sulphuric acid, and thereafter the liquid is raised to the boiling-point, and the silk continued to be worked in it. The goods are then washed in water, worked in a bath of soap-lather, rinsed, and finished in a weak acid bath.

Wool is dyed with aniline purple, violine, roseine, fuchsine, and chinoline by merely working the yarn or cloth in a vat containing a water-solution of the colouring matter at a temperature ranging between 112° and 140° F.

Cotton has not the power of firmly attaching, directly, coal-tar colours to its fibre so as to resist the action of soda and of soap. When the cotton, however, is treated with a solution containing much tannin, such as a decoction of sumach, or galls, for an hour or so, then introduced into a dilute solution of alum or stannate of soda, and, lastly, passed into a dilute acid liquid, and washed in water, it acquires a great power of firmly attaching aniline purple, roseine, violine, fuchsine, and chinoline colours, whenever it is worked in a dye-vat containing these colouring matters. This principle of the attachment of these colours to cotton by means of a mordant of tannin and alum, may be applied in printing patterns upon cloth, as in Calico-printing (q. v.). The pattern is printed on the cloth by means of tannin and alum dissolved in water and thickened with gum; and afterwards, when the prepared goods have been introduced into a hot dilute acid solution of the colouring matter, the dye becomes attached to those parts on which only the tannin has been printed, and leaves the other parts uncoloured. Another mode is to mix the dye with albumen or lacterine, print on the cloth, and then subject to the action of steam, which coagulates the albumen or lacterine, and at the same time fixes the colour on the cloth.

**DYING DECLARATION.** By the law of all nations, the declaration of a party, made in the immediate prospect of death, relative to the mode of his death, is received as evidence. The ground of this exception to the general rule of law, that hearsay evidence is inadmissible, is thus clearly stated by Lord Chief Baron Eyre: 'That they are declarations made in extremity, when the party is at the point of death, and when every hope of this world is gone; when every motive to falsehood is silenced, and the mind is induced, by the most powerful considerations, to speak the truth: a situation so solemn and so awful is considered by the law as creating an obligation equal to that which is imposed by a positive oath in a court of justice.' In Scotland, the dying declaration of a witness is admissible even though he is not himself conscious of the danger of death. In this respect, the law of Scotland differs from that of England and America. The general rules as to dying declarations are, that they cannot be received in any civil case, and in criminal cases only where the death of the deceased is the subject of the charge, and the circumstances of the death are the subject of the dying declaration. They must be made, except in Scotland, with the full knowledge of impending death; they are subject to the ordinary rules of law as to capacity to give evidence; they must relate to facts only, and not opinions, and must be freely made; they must be complete in themselves, and if it appear that the dying man intended to qualify them, they cannot be received. See Taylor on *Evidence*.

**DYKE**, or DIKE (Dutch, *dyk*), an artificial mound along the bank of a river or sea-shore, erected for the purpose of preventing inundation. The term is from the same root as *dig*—hence also *ditch*, or the hollow from which the dyke is formed. The French employ the term *levée* to signify this species of embankment, of which there is a notable example in the levées erected along the Mississippi near New Orleans. The principle on which dykes or levées are formed is very simple. The embankment must be of sufficient breadth and height to resist the pressure of the water, and must be constructed with that easy slope which will allow the floods to rise without any particular impediment. This is quite understood in practical engineering. Flowing water must not be abruptly resisted, but suffered to rise gradually and expend itself. It is accordingly of the first consequence, in all attempts to restrain water by embanking, that the mounds should possess not only magnitude, but a very gradual rise in the side which has to resist the impact of the flood. For want of attention to this method of embanking, there has often been much ineffectual dyking of the sea and rivers liable to do damage by flooding.

In no country has the erection of dykes been carried to such a length as the Dutch Netherlands. Consisting to a large extent of low meadow-land, formed of materials brought from Switzerland and Germany by the Rhine, there is a constant liability to be deluged by the several branches of that river previous to their entering the sea. Inspired by a sense of their perilous situation, as well as a naturally industrious and painstaking disposition, the Dutch have for ages been distinguished for their ingenious system of river-embanking; till at length the dykes of Holland are spoken of as almost one of the wonders of the world. While the country generally is guarded against sea-inundations by high mounds of sand or dunes, created by the deposit of light sand blown from the level shores (see DUNE), the interior is secured from the rivers by the system of dykes here referred to. These ramparts are in appearance long green mounds, broad at the base, graduated in their slope, and often of sufficient width to admit of a canal or road, or both, being formed along the top. To give strength to the fabric, willows are planted and also interwoven like wicker-work on the sides. Carried along the banks of rivers, and in some places along the margin of the sea, as well as crosswise in different parts of Holland, a singular net-work of embanking is presented, which answers the double purpose of a protection from inundation and a means of having canals, by which superfluous water pumped from the meadows, or *polders*, may be run off into the sea. The whole system of dyking is placed under local and general superintendence, at a considerable cost to the public. One of the most gigantic of these dykes is that along the Helder; it measures about six miles in length, 40 feet broad at the summit, along which there is a good road, and descends into the sea by a slope of 200 feet, inclined about 40 degrees. Notwithstanding the precautions taken, one or other of the lower branches of the Rhine occasionally overflows its banks and lays a wide district of country under water. One of these inundations took place in the winter of 1860—1861, and, committing immense havoc, was the cause of much loss and suffering. A good example of dyking for the purpose of drainage is shewn near Haerlem, where it has facilitated the withdrawal of the Haerlem Sea (q.v.).

DYKES. In volcanic districts, rents frequently occur which are filled with molten materials from below, that subsequently solidify, and form solid walls, filling the fissures, and separating the edges of the disjointed strata. To these walls, geologists apply the term dyke, a Scottish word for a wall or fence. Similar walls of intruded matter occur in stratified rocks of all ages, and have been connected with volcanic eruptions belonging perhaps to every geological epoch. They consist of similar materials to whatever period they belong—viz., lava, either in a granular, compact, or glassy condition. The dykes connected with Vesuvius have been minutely described. Those in the great escarpment which Somma presents to the modern crater of Vesuvius permit of a careful examination. They are chiefly vertical, and traverse at right angles the beds of lava, scoriæ, breccia, and sand which form the ancient cone. They project in relief several inches, or sometimes feet, from the face of the cliff, being extremely compact, and less destructible than the intersected tuffs and porous lavas. In vertical extent they vary from a few yards to 500 feet, and breadth from one to 12 feet. Many of them cut all the inclined beds in the escarpment from top to bottom, others stop short before they ascend above half-way, and a few terminate at both ends, either in a point or abruptly. In mineral composition, they scarcely differ from the lavas of Somma. Their texture is different at the edges and in the middle; toward the centre, the rock is larger grained, while at the edge it is always finer grained, sometimes vitreous. This evidently arises from the rate of cooling, it being known that molten trap or lava, when suddenly cooled, assumes a vitreous structure, while a slow cooling, as it permits the mass to remain in a condition fitted for the operation of the crystalline force, and the segregation of the separate materials, produces a more or less granular structure, in proportion to the time occupied in cooling. The rock forming the dykes is far more compact than that of ordinary lava, for the pressure of a column of melted matter in a fissure greatly exceeds that in an ordinary stream of lava; and pressure checks the expansion of those gases which form vesicles in lava. When the fissures have been openings for the egress of molten matter, the surfaces have been worn and smoothed by the current, the intense heat having melted all projections and obstructions to the passage of the incandescent fluid.

The appearances of ancient trap-dykes are very similar to those of recent volcanic dykes. Trap-dykes generally are prominent objects in the landscape, because, while the softer rocks through which they have intruded have been abraded by the sea, rivers, or rain, they, being more compact, stand out prominently in the face of precipices or on the level surface of a country. Sometimes, however, from chemical action, and chiefly from the oxidation of the iron which all trap-rocks contain to a greater or less extent, the intruded dyke decomposes more rapidly than the containing rock. It then for some feet or yards leaves the original fissure again unoccupied. A singular modification of this arrangement may sometimes be noticed, when the intruded igneous rock has so indurated the beds through which it passed as to make them less liable to weather than the unaltered portions of the beds, or than even the dyke itself. In such cases, we find two parallel walls of indurated strata rising above the general level of the country, and forming the banks of a ditch produced by the disappearance of so much of the dyke. All these appearances may be observed in the island of Arran, a locality unsurpassed for observing those remarkable geological phenomena. Some dykes have had no apparent influence on the adjoining strata, even when these consist of materials most liable to be affected by heat. Thus seams of coal sometimes remain unaltered, though in contact with the supposed injected molten matter. Considerable doubt is thus cast upon the generally received opinion, that in all cases dykes were intrusions of lava. The effects that have been produced in numerous instances can, however, only be accounted for by supposing that the adjacent rocks have been affected by heat. The writer has observed in Arran, at a place where a dyke cut at right angles an older one, that the edges of the older dyke, which had been acted upon by the current of liquid lava, were converted into true obsidian to the depth of nearly half an inch. In Anglesea, shale at the edge of a dyke 134 feet wide has been converted into hard porcellanous jasper; and argillaceous limestone loses its earthy texture, and becomes granular and crystalline. The chalk, in Antrim, is converted, by basaltic dykes, into granular marble. Coal, as might have been expected, is often altered in an extraordinary degree. Witham describes the effects of the Cockfield Fell dyke on a seam of coal through which it passes. It is a nearly vertical wall of trap, 18 or 20 yards thick, and is traceable to a distance of 70 miles running in a south-east direction. The coal is about 6 or 8 feet thick, and is affected about 50 yards from the dyke. It first loses the calcareous spar, which occurs in the joints and faces, begins to look dull, and loses its quality for burning. As it comes nearer, it assumes the appearance of a half-burnt cinder; and approaching still nearer the dyke, it grows less and less in thickness, becoming a pretty hard cinder only two feet and a half in thickness. Eight yards further, it is converted into real cinder; and more immediately in contact with the dyke, it becomes a black substance resembling soot caked together, the seam being reduced to nine inches in thickness. The coal thus deteriorated is 25 yards of bad short coal, half reduced to cinder; 16 yards of cinder; and 10 of sooty substance.

**DYNACTINO'METER**, an instrument employed for measuring the actinic force of light, and for comparing the degrees of rapidity with which photographic lenses act. It is too complex in use, and too expensive, to admit of being generally adopted. For a detailed description, the reader is referred to Hunt's *Photography*.

**DYNA'MICS** is that division of Mechanics (q. v.) which contains the doctrine of the motion of bodies produced by forces. It is essentially a science of deduction from the laws of motion (see MOTION, LAWS OF), under which head will also be found a brief sketch of the growth of the science. The branches of dynamics capable of being treated in the present work will be found discussed under separate heads. We shall here confine ourselves to giving a view of the main branches and their correlation. I. The first branch of dynamics deals with the fundamental conceptions of the science, their names and definitions, such as velocity (q. v.) and the different kinds of motion (q. v.), and accelerated motion (q. v.); force, accelerating force, and moving force (see FORCE). Under this branch also falls the composition of motions (see COMPOSITION OF FORCES AND MOTIONS). II. The second main branch of dynamics treats of the motion, free or constrained, of points. Here two problems are solved in each case—i. e., whether the motion be free or constrained—viz., a direct and an inverse problem; as, for example: 1. To determine the path of a point when the forces are given which act upon it; 2. To determine the forces or force acting on a point when its path is given. This division of dynamical problems into direct and inverse, obtains in all the branches. It may be mentioned that it was by solving the inverse problem that Newton and Huygens effected their greatest glories in connection with dynamics. The method of treating the case of a free point now generally employed, is due to Euler. See, under this head, CENTRAL FORCES; FALLING BODIES, and PROJECTILES. III. The third main branch of dynamics is concerned with the motion of a rigid system of points, or of a solid body. Few of the sub-branches of this part of dynamics are capable of exposition in this work, but see CENTRE OF GYRATION, CENTRE OF OSCILLATION, CENTRE OF PERCUSSION, and PENDULUM. The honour belongs to D'Alembert of establishing a general method of treating problems in rigid dynamics. Previous to his time, each set of such problems was treated on some principle peculiarly applicable to itself. D'Alembert invented one (which goes by his name) applicable to all such problems. For a statement of this principle, see RIGID DYNAMICS. IV. The fourth main branch of dynamics is concerned with motions of rotation. A system of rigid points may be subject to two independent kinds of motion. It may suffer a motion of *translation* in space, or a motion of *rotation* about some point or axis within itself, or it may suffer at once a motion of translation and a rotatory motion. These may clearly be treated conjunctly or independently; they are now uniformly treated independently, by investigating, 1. The velocity and direction of the centre of gravity of the system; and, 2. The direction at each instant of the spontaneous axis of rotation passing through the centre of gravity (see ROTATION), and the velocity of the rotation of the system round that axis. To effect the second task, Poinsot proposed his theory of Couples (q. v.). Several general theorems in dynamics, not above mentioned, will be found discussed under various heads, to which the reader is now referred. For the *conservation of areas*, see CENTRAL FORCES. For the conservation of living forces (*virium vivarum*), and the principle of least action, see FORCES. See also MOMENTS OF INERTIA, and IMPACT.

**DY'SART**, a royal parliamentary and municipal burgh and seaport in the south of Fifeshire, on the rocky shore of the Firth of Forth, 12 miles north-north-east of Edinburgh. It chiefly consists of three streets, with a small square. In the High Street are many antique houses, with inscriptions and dates. It has ship-building, flax-spinning, and manufactures of damasks and ticks. In the vicinity are coal and ironstone mines. Pop. (1861) 8067. It unites with Kirkcaldy, Burntisland, and Kinghorn, in sending a member to parliament.

**DYSCRA'SIA** (Gr. *dys*, difficult, and *krāsis*, a mixture), a pathological term much used in Germany by certain authorities, to indicate an altered condition of the blood and fluids of the system, leading to constitutional diseases, as dropsy, cancer, delirium tremens, lead-poisoning, &c. See CACHEXIA and DIATHESIS.

**DY'SENTERY** (Gr. *dys*, difficult, and *enteron*, the intestine), a form of disease attended by discharges from the bowels, and differing from Diarrhœa (q. v.) chiefly in being attended by marked fever and pain, as also by the presence of blood and inflammatory products in the discharges. Dysentery is, in fact, a disease of the mucous membrane of the Colon (q. v.) or great intestine, and when severe, it is followed by the destruction of that mucous membrane to a great extent, the intestine becoming much contracted at intervals, especially in its lower part, and the evacuations being therefore apt to be retained, especially the solid portions. The most distinctive symptoms are excessive pain in evacuating the bowels, and frequent ineffectual attempts at evacuation (*tenesmus*), tenderness on pressure in the left side of the abdomen, discharges of blood mixed with mucus, and comparatively little fæcal matter; these symptoms being accompanied or followed by intense fever, passing into early depression of strength. Dysentery is a disease of extreme danger in many cases, and should always be placed early under medical treatment. The best domestic plan, when medical advice cannot be at once procured, is to give a moderate dose of castor oil, guarded by twenty or thirty drops of laudanum, and then either Dover's powder in ten-grain doses every hour or two, or ipecacuanha wine in two or three successive teaspoonful doses at similar intervals, each with ten or twenty drops of laudanum, according to the effect on the system. If vomiting is repeatedly produced, the dose of ipecacuanha wine should be lessened. If the pain and irritation of the bowels are extreme, the opium had better be given by a small injection (see CLYSTER) with starch, after the lower bowel has been well cleansed by a larger warm-water injection; and it will be well to repeat the simple warm-water injection at intervals throughout the treatment. Dysentery, in its most severe forms, is commonly a disease of the tropical zone. It is often found in connection with inflammation of the liver.

**DY'SLYSINE** is an organic substance ($C_{48}H_{36}O_6$) obtained by boiling choloidic acid with hydrochloric acid for some time. It is a neutral resinous body, which is difficultly soluble in naphtha, turpentine, and other common solvents.

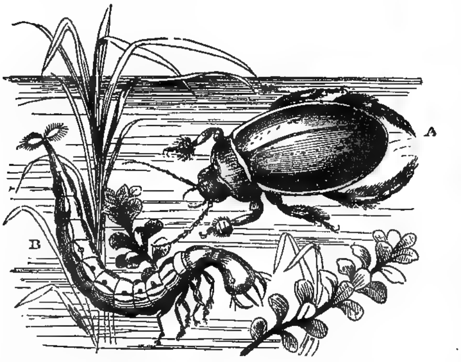
**DY'SODIL**, a yellow or grayish laminated bituminous mineral, often found with lignite. It burns vividly, and diffuses an odour of assafœtida.

**DYSPE'PSIA** (Gr. *dys*, difficult, and *pepsis*, digestion), a scientific term for Indigestion (q. v.).

**DYSPNŒ'A** (Gr. *dys*, difficult, and *pnœa*, breathing), a word the meaning of which is sufficiently indicated by its etymology. See ASTHMA; RESPIRATION; LUNGS, DISEASES OF, &c.

**DYSU'RIA** (Gr. *dys*, difficult, and *ouros*, urine), a difficulty of passing urine. It may depend on a variety of causes, as regards which, see BLADDER; and URETHRA, DISEASES OF.

**DYTI'SCUS** (Gr. *dytes*, a diver), a Linnæan genus of aquatic coleopterous insects or water-beetles, now forming the tribe or family *Dytiscidæ*. They are *pentamerous* coleoptera; that is, have all the *tarsi* five-jointed. Their general form is oval, the outline little broken, and the surface very smooth. The respiratory organs of the perfect insect are not adapted to the extraction of air from water, and it must occasionally come to the surface to breathe, where it rests for a short time back downward, and with the extremity of the abdomen exposed to the air, the openings of the air-tubes being in the last segment. The *Dytiscidæ* are excessively voracious, feeding upon any kind of animal food, and boldly attacking creatures larger than themselves. They are very amusing inmates of the fresh-water aquarium, and sometimes live in it for a year or two, getting tame, and readily coming to be fed with small earthworms, bits of beef, &c. The species are numerous, and vary much in size, some being very small, and some almost two inches in length. A very common British species is *D. marginalis*, about an inch and a quarter in length, of a dark olive colour, the thorax and outer sides of the elytra margined with yellow. All the species are found in lakes, ditches, marshes, and the still parts of rivers. They often leave the water by night, and can fly well. Their larvæ have the body long and tapering, composed of eleven rings or segments, besides the head. They hide themselves in the earth, in chambers which they make for themselves, before changing into pupæ.



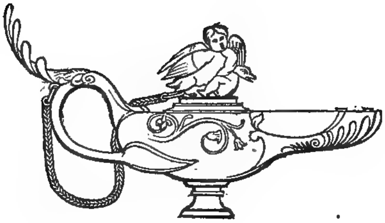
A, Dytiscus Marginalis, or great Water-beetle; B, larva.

**DY'VEKÉ** (i. e., *dove*), called by the Latin chroniclers Columbula, the mistress of Christian II. of Denmark, has been often celebrated in works of poetry and fiction. She was born in Amsterdam in 1488, and Christian became acquainted with her in 1507 in Bergen, where her mother, Sigbrit Wylms, had settled as an innkeeper. She followed him to Opslow, and, when he mounted the throne, to Copenhagen. Notwithstanding the marriage of Christian with Isabella, the sister of the Emperor Charles V., his relation with D. was continued, and her mother acquired unbounded influence in the affairs of the country. Though D. herself never interfered, she was naturally hated by the party of the nobles; and her death, which happened suddenly in 1516, was attributed, with almost certainty, to poison. The poison was understood to have been administered to her in cherries by the noble and proud relations of the governor of the palace, Torben Oxe, who was a suitor for the affections of Dyveké. On her death, the character of Christian broke out in all its savageness. He first ordered the treasurer Faaburg to be executed for having said that Torben Oxe had enjoyed the favour of D.; and then at the instigation, as was given out, of a nightly vision, Torben Oxe himself. Samsöe, a Danish poet, wrote, about the end of the 18th c., a tragedy called *Dyvěke*, often represented in Copenhagen. The story has since been made the subject of several novels and tragedies; e. g., *Wilhelm Zabern*, by J. C. Hauch, a Dane; and Riekhoff's tragedy, *Düveke* (Berl. 1843).

**DY'VOUR AND DYVOUR'S HABIT** (from the Fr. *devoir*, to owe; a debtor). In the old legal language of Scotland, a dyvour seems to have been synonymous with a bankrupt. Skene speaks of a dyvour, or 'bairman' (bare-man), as one who, 'being involved and drowned in debts, and not able to pay or satisfy the same, for eschewing of prison and other pains, makes cession and assignation of all his goods and gear in favour of his creditors, and dons his devour and duty to them, proclaiming himself bairman and indigent, and becoming debt-bound to them of all he has.' It was ordained by act of Sederunt (q. v.) of 17th May 1606, that a pillory be erected near the Market Cross of Edinburgh, with a seat upon it, upon which dyvours shall be exposed once on a market-day; and before their liberation from jail, they are required to provide themselves with a hat or bonnet of yellow colour, to be worn by them while thus exposed, and constantly thereafter, while they continue dyvours, under pain of three months' imprisonment if they be found without it. By subsequent acts (26th February 1669, and 23d January 1673), the dyvour's habit is appointed to be a coat or upper garment, half yellow and half brown, with a party-coloured cap or hood, to be worn on the head; any of his creditors being entitled to imprison him if he be found without it. The act of sederunt of 18th July 1688 prescribes as the dyvour's habit, 'a bonnet, partly of a brown and partly of a yellow collour, with uppermost hose, or stockings, on his legs, half brown and half yellow colloured, conform to a pattern delivered to the magistrates of Edinburgh, to be keeped in their tolbooth;' and declares that the Lords will not hereafter dispense with it, unless in the case of innocent misfortunes. Finally, by statute (1696 c. 5), the Lords of Session are prohibited from dispensing with the dyvour's habit unless, in the process of Cessio Bonorum (q. v.), the bankrupt's failure be alleged and proved to have been by misfortune. This statute is repealed, and the dyvour's habit abolished, by 6 and 7 Will. IV. c. 56—previous to which time the barbaric practice of wearing the habit had, by sufferance of the court, been departed from.

**DZE'REN.** See ANTELOPE.

**DZI'GGETHAI, DJI'GGETAI, KÏA'NG, KHUR**, or GOOR (*Equus Hemionus*), a quadruped nearly allied to the ass, and believed to be the *hemionus* of Herodotus and Pliny. See Ass. It inhabits the elevated steppes of Tartary, extending into the south of Siberia and to the borders of India. In appearance and characters, it is intermediate between the horse and the ass, whence the ancient Greek name *hemionus* (half-ass). In size it approaches the horse, which it resembles also in gracefulness of action, and in its neighing, which is even more deep and sonorous. Its general shape is much like that of a mule. The D. lives in small herds, sometimes of several males and several females, sometimes of a single male with about twenty females and foals. It is an animal of great fleetness and shyness, or watchfulness, and possesses also great powers of endurance in flight, so that it is with difficulty killed by the hunter. The Mongols and Tunguse, however, hunt it very eagerly on account of its flesh. It has been domesticated and reduced to the service of man, but there does not seem to be any evidence of its ever breeding in a state of domestication.



# E

**E**, THE fifth letter in the Græco-Roman alphabets. Its original and fundamental sound is that heard in Eng. *tent.* The sound heard in *me* is not given to it in any language but English. In the series of vowels it stands intermediate between *i* and *a*. See LETTERS AND ARTICULATE SOUNDS, where the various vowel-sounds represented by the character *e* in English will be noticed.

E, in Music, is the third note or sound of the natural diatonic scale, and is a third above the tonic C, to which it stands in proportion as 5 to 4. As a major third, that is, when the tonic C vibrates 4 times, the E above vibrates 5 times. E is the third harmonic which arises naturally from C as a fundamental note. E major, as a key, has four sharps at its signature, viz., F, C, G, and D sharp. E minor, as a key, has only one sharp, F, same as G major, of which E is the relative minor.

**EADMER OF CANTERBURY**, a man of considerable mark in the beginning of the 12th c., would seem, from his name, to have been the child of English parents. At an early age, he entered the Benedictine monastery of Canterbury; and when St Anselm, in 1093, was made archbishop of that see, E. became one of his most devoted friends, sharing his exile, watching his death-bed, ordering his burial, and writing the chronicle of his life. E. continued at Canterbury, in high esteem with St Anselm's successor, Archbishop Ralph, until 1120, when, at the request of King Alexander I., he went to Scotland, and was there chosen Bishop of St Andrews. The question of lay investiture of ecclesiastical benefices was then in its crisis; there was a controversy between Canterbury and York for jurisdiction over the see of St Andrews; that see, again, asserted its independence of either of the English metropolitans; and E. seems to have added to all these perplexities a difficulty as to his monastic allegiance. 'Not for all Scotland,' he said to the Scottish king, 'will I renounce being a monk of Canterbury.' The king, on his side, was equally unyielding; and the issue was the return of E. to his English monastery, unconsecrated, indeed, but still claiming to be Bishop of St Andrews. He was made precentor of Canterbury, and died, it is supposed, in January 1124. He tells us that, from his childhood, he was a diligent observer of contemporary events, especially in church affairs; and this habit has given more than usual interest to his writings. The most valuable are his *Historia Novorum*, or History of his Own Times, first printed by Selden in 1623, and his *Vita Anselmi*, or Life of St Anselm, first published at Antwerp in 1551. Both these works are included in the selection of his writings published by the Benedictines of St Maur (as a supplement to their edition of the works of St Anselm), in 1 vol. fol. (Paris, 1721). His lives of St Odo, St Dunstan, and St Bregwyn, of Canterbury, and of St Wilfrid and St Oswald, of York, were printed, some of them, by Wharton, in the second part of his *Anglia Sacra* (Lond. 1691), and others by Gerberon in his *Anselmi Opera* (Paris, 1675). The history of E., in relation to the bishopric of St Andrews, is given at considerable length by Lord Hailes, in his *Annals of Scotland*, vol. i. pp. 59—71; and, still better, in Mr Grub's *Ecclesiastical History of Scotland*, vol. i. pp. 209—217 (Edin. 1861).

**EA'GLE** (*Aquila*), a genus of birds of prey, by some naturalists subdivided into several genera, constituting a group which contains the largest and most powerful of the *Falconidæ*. From the most ancient times, the E. has been universally regarded as the emblem of might and courage; and, like the lion, it has been fancifully invested with other attributes of greatness, such as men thought to harmonise with these. Its extraordinary powers of vision, the vast height to which it soars in the sky, the wild grandeur of the scenery amidst which it chiefly loves to make its abode, and perhaps also its longevity, have concurred to recommend it to poetic regard. It was associated with Jupiter in the Roman mythology; its figure on the standards of the Roman legions expressed and animated their confidence of victory (see under).

The eagles have the beak not curved from the very base, like the true falcons, nor notched on the edge, neither are their wings so long in proportion to their size. Their wings are, however, very broad and expansive; their legs are very robust; their claws curved, sharp, and strong. In the most restricted use of the generic term, the true eagles, of which the Golden E. may be taken as a type, have a rather short bill, curved from the cere, with a slight festoon on the edge of the upper mandible, the tarsi are short, and feathered down to the toes. This last character distinguishes them at once from the Ernes (q. v.), often also called eagles. There are several species of true eagles well ascertained, although in this as in allied genera much confusion has arisen from the diversity of plumage at different ages.—The GOLDEN E. (*A. chrysaëtos*)—of which what is called the Ring-tailed E. is the young—is about three feet or three feet and a half in length, and eight feet in spread of wing. The female is rather larger than the male; the colour is dark brown, in some parts almost black, the head and back of the neck in mature birds covered with pointed feathers of a golden-red colour; young birds have a considerable part of the tail white. The Golden E. is the largest of the European eagles, and is found not only throughout Europe, preferring wild and mountainous situations, but throughout almost the whole northern hemisphere: it is amongst the birds of India, of the north of Africa, and of North America; and the savage warrior of the Rocky Mountains, 'as well as the Highland chieftain, glories in his eagle plume.' Although occasionally seen in all parts of Britain, it builds its nest only in mountainous districts, carrying a few sticks and brambles to the inaccessible shelf of a rocky precipice, where the eggs are deposited almost on the bare rock. The Golden E. is now rare even in the Highlands of Scotland. A great quantity of prey is necessary to support a pair of these birds and their two or three young ones; and not only hares, game of every kind, and lambs are carried to the eyrie, but larger animals are sometimes attacked, and almost every district where eagles build their nests has its story of children carried off to feed the eaglets, and often of their almost miraculous preservation.—The next in size to the Golden E. among the eagles of Europe, is the Imperial or Grecian E. (*A. imperialis*), but it is more common in Egypt than in Europe, and has never been seen in Britain.—The Spotted E. (*A. nævia*) has occurred in the south of Ireland.—There is an Australian E. (*A. fucosus*).

Eagles were ranked among what were called, in the language of falconry, ignoble birds of prey, as incapable of being tamed and employed to assist in the sports of man. But either the Golden E. or the Imperial E. is used by the Tartars in the chase of antelopes, wolves, foxes, hares, &c.

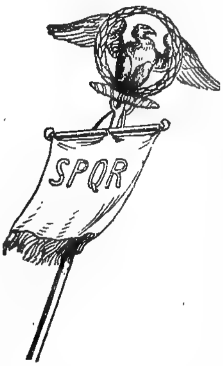
The White-tailed E. or Cinereous E. of Britain is the common Erne (q. v.). The White-headed E. or Bald-headed E. of America—the chosen emblematic E. of the United States—is also an erne. What particular species was the emblematic E. of the ancients, is not more certain than what is the original emblematic Scotch thistle.—Others of the E. group of *Falconidæ* are known as Marsh Eagles, Harpy Eagles, Eagle-hawks, Ospreys, &c., some of which will be noticed in their places.

The head and foot of the golden eagle are figured in the article Accipitres, its skeleton in the article Birds.

Eagle Displayed.

**EAGLE**, the king of birds, is used heraldically as an emblem of magnanimity and fortitude. It is variously represented, the best known mode being Displayed (q. v.) or spread out, either with two heads—as in the arms of the German empire, in which case it is popularly known as a spread eagle—or with one head, as in the arms of the kingdom of Prussia.

**EAGLE**, as a military standard, was adopted by the Romans, and even by nations preceding them in history. The Persians, in the time of Cyrus the Younger, bore an eagle on a spear as a standard. The Romans for some time used the eagle, the wolf, the boar, the horse, and the minotaur for standards, but afterwards abandoned the last four, and confined themselves to the first. The Roman eagle, sometimes of gold, but more frequently of silver, was about as large as a pigeon with extended wings, and was borne on the top of a spear, with a cross-bar or a shield to support it. Some of the eagles were represented as holding thunderbolts in their talons, and usually bore the name of the legion to which each respectively belonged. The eagle was sometime made of steel, but rarely.



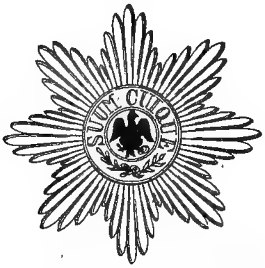
Roman Eagle.

In modern times France, Russia, Prussia, Austria, and the United States of America, have all adopted the eagle as a national military symbol. The Austrian eagle is represented double-headed.

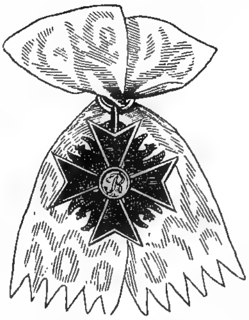
**EAGLE**, a gold coin of the United States of America, of the value of ten dollars. See Dollar.

**EAGLE**, Black, Order of the, in Prussia, was founded by the Elector of Brandenburg, on 17th January 1701, the day of his coronation as king of Prussia. The number of knights, in addition to the princes of the royal family, was originally 30, but it is now unlimited. They must at their nomination be at least 30 years of age. They must prove their noble descent for four generations through both parents. A chapter is held twice a year.

The insignia of the order consist of an octagonal cross of blue enamel, and a black eagle, displayed between each of the arms of the cross. The cross is suspended by a broad ribbon of orange colour across the left shoulder, and it is accompanied by an embroidered silver star, fastened on the left breast. The centre of the star represents a black flying eagle, holding in one claw a laurel wreath, and in the other a thunderbolt, with the legend, *Suum cuique.* Fifty ducats must be paid by every new member for the support of the Orphan Asylum at Königsberg, and he then receives gratis the costume and insignia of the order, of which a full description will be found in Burke's *Orders of Knighthood*, p. 199. As the Black Eagle is the highest order in Prussia, no member of it, with the exception of foreign princes and knights of St John, is permitted to wear any other order along with it; and as it is generally granted only to those who are expected to be about the person of the king, no one who holds it is permitted to travel from the court more than twenty German miles without giving notice. Knights of the Black Eagle are likewise knights of the Red Eagle (q. v.), first class.



Star of the Order of the Black Eagle.



Ribbon and Cross of the Order of the Black Eagle.

**EAGLE**, Red, Order of the, in Prussia, founded in 1734 by the Markgraf George Frederick Charles, as a reorganisation of the 'Ordre de la Sincérité,' which had been instituted in the beginning of the century by the hereditary prince of Anspach and Baireuth. After passing through various modifications, the order of the Red Eagle was raised in 1791 by Frederick William II. to the rank of the second order in the monarchy, and it was then that the decoration of a white enamelled Maltese cross, surmounted by a royal crown, with the Brandenburg eagle in the corner, was adopted. All the knights of the Black Eagle were received into this new order; and it was latterly decreed that only those who had been decorated with the Red Eagle, in the first instance, could be received into the black. In 1810, the order of the Red Eagle was reorganised, and two more classes were added to it. In 1830, the second class was subdivided into two, one of which only was allowed to wear a square star.

**EAGLE HAWK** (*Morphuus* or *Spizaëtus*), a genus or sub-genus of *Falconidæ*, of the eagle group, but consisting of species of comparatively small size, and characterised by short wings, long slender legs (*tarsi*), and comparatively feeble toes and claws. Some of the species are extremely beautiful in form and colours. They are natives of warm climates, chiefly of South America, but also of Africa and the East Indies. The Crested E. (*M. cristatus*) of Guiana, and the Brazilian E., or Urubitinga (*M. Urubitinga*), may be mentioned as examples. The latter, although not so large as a goose, is sometimes called the Brazilian eagle.

Eagle-Hawk (*Morphuus cristatus*).

Eagle Owl (*Bubo maximus*).

**EAGLE OWL** (*Bubo*), a genus of the Owl (q. v.) family (*Strigidæ*), characterised by a somewhat incomplete facial disc, two tufts of feathers (*horns* or *egrets*) of considerable size on the head, ears with small openings (*conchs*), legs and toes covered with feathers, short strong curved bill, and long curved sharp claws. To this genus belong the largest of the nocturnal birds of prey. The E. O. of Europe (*B. maximus*) is little inferior in size to the Golden Eagle, and preys on quadrupeds such as hares, rabbits, and young deer, and on grouse, partridges, and other kinds of game. It seizes its prey with its feet, and seldom touches it with the bill till its struggles are over. It is an inhabitant of many parts of Europe and Asia, but it is only a rare occasional visitor in Britain. The loud peculiar cry of this bird, resounding strangely through the night, has obtained for it its German name of *Uhu*, and an intimate association from time immemorial with evil omens and superstitious terrors.—The E. O. of America (*B. Virginianus*), the Virginian Horned Owl or Great Horned Owl, is very similar to the species just noticed, but of inferior size, although still a large and powerful, as it is also a bold bird. It does not scruple to attack half-grown turkeys, and often succeeds in making them its prey. It carries off with ease almost any other inhabitant of the poultry-yard. It is found in almost all parts of America.

**EAR, The, Anatomy and Physiology of.** The apparatus of hearing, as it exists in man and the mammalia, is composed of three parts—the external ear, the middle ear or tympanum, and the internal ear or labyrinth.

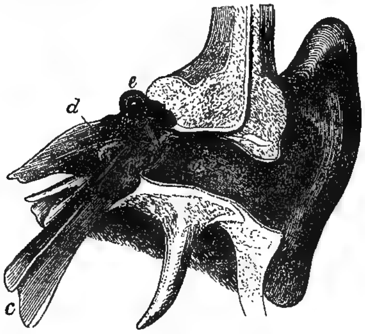


Fig. 1.

General view of the external, middle, and internal ear, shewing the interior of the auditory canal, tympanic cavity, and Eustachian tube.

*a*, the auditory canal; *b*, the tympanum; *c*, the Eustachian tube, leading to the pharynx; *d*, the cochlea; and *e*, the semicircular canals and vestibule, seen on their exterior by the removal of the surrounding bony tissue.

The *external ear* consists of two portions, the *auricle* or *pinna* (the part popularly recognised as the ear), and the *auditory canal* or *external meatus*.

The auricle, on its outer or more exposed surface, presents various eminences and depressions, resulting from the form of its cartilaginous framework. These have received special anatomical names, to which it is unnecessary to advert further than to mention that the deep capacious central space to which several grooves converge, is termed the *concha*, and that the lowest and pendulous portion of the ear is termed the *lobe*. The cartilage forming the basis of the external ear consists of one principal piece, in which there are several fissures, which are filled up by fibrous membrane. Several muscles are described as passing from one part of the auricle to another, but they are so little developed in man that they do not require notice; there are additionally three muscles—the *attollens aurem* (or *superior auris*), the *attrahens aurem* (or *anterior auris*), and the *retrahens aurem* (or *posterior auris*), which pass from adjacent parts of the scalp to the ear, and which, though more developed than the previous group, are of little or no real importance in man (at least in his civilised state), but are of considerable use in many mammals. Their actions are sufficiently indicated by their names.

The auditory canal passes from the concha inwards, and a little forwards, for rather more than an inch. It is narrower at the middle than at either extremity; and on this account there is often considerable difficulty in extracting foreign bodies that have been inserted into it. The membrane of the tympanum which terminates it is placed obliquely, in consequence of the lower surface of the meatus being longer than the upper. The canal is partly cartilaginous and partly osseous; the osseous portion consisting in the fœtus of a ring of bone, across which the membrane is stretched, and in many animals remaining persistently as a separate bone. The orifice of the meatus is concealed by a pointed process, which projects from the facial direction over it like a valve, and which is called the *tragus*, probably from being sometimes covered with bristly hair like that of a goat (*tragos*); and it is further defended by an abundance of ceruminous glands, which furnish an adhesive, yellow, and bitter secretion (see CERUMEN), which entangles small insects, particles of dust, and other small foreign bodies, and prevents their further passage into the meatus.

The *middle ear*, or *cavity of the tympanum*, is a space filled with air which is received from the Pharynx (q. v.) through the Eustachian tube (see fig. 1, *b*, *c*), and traversed by a chain of very small movable bones (fig. 2), which connect the membrane of the tympanum with the internal ear. It lies, as its name implies, between the external meatus and the labyrinth or internal ear, and opens posteriorly into the cells contained in the mastoid portion of the Temporal Bone, which are also filled with air, and anteriorly into the Eustachian tube. The cavity is of an irregular shape, and is lined by a very delicate ciliated epithelium, which is a prolongation of that of the pharynx through the Eustachian tube.

Its external wall is mainly formed by the membrane of the tympanum, which is nearly oval, and placed in a direction slanting inwards, so as to form an angle of about 45° with the floor of the auditory canal (see fig. 1). The handle of the malleus (or hammer), the first of the chain of ossicles (see fig. 2), is firmly attached to the inner side of this membrane in a vertical direction as far downwards as the centre, and by drawing it inwards, renders its external surface concave.

Its internal wall has two openings communicating with the internal ear, each of which is closed by a delicate membrane. These openings are termed, from their respective shapes, the *fenestra ovalis*, and the *fenestra rotunda;* the former leads to the vestibule, and is connected by its membrane with the base of the stapes (or stirrup-bone), the last of the chain of ossicles; while the latter opens into the cochlea.

The ossicles of the tympanum are three—viz., the *malleus*, the *incus* (or anvil), and the *stapes*. We have already explained how the malleus is connected with the membrane of the tympanum by means of its handle. Through this connection, the tension of that membrane may be modified by the agency of one or two muscles which are attached to this ossicle. These muscles are the *Laxator tympani*, which arises from the spinous process of the Sphenoid Bone (q. v.), and is inserted into the processus gracilis; and the *Tensor tympani*, which arises from the under surface of the petrous portion of the temporal bone, and is inserted into the handle of the malleus immediately below the commencement of the *processus gracilis*. The existence of the former of these muscles is doubtful, many anatomists regarding the structure in question as ligamentous rather than muscular. The mode in which this bone articulates with the incus is sufficiently explained by the figure. The *incus* much more closely resembles a molar tooth with two fangs, than the anvil from which it derives its name. Of the two processes which it gives off (see fig. 2), the short one, *sc*, runs backwards, and projects into the mastoid cells behind the tympanic cavity; while the long one, *lc*, inclines downwards, and terminates in the lenticular or orbicular process, *a*, to which the head of the stapes is attached. The *stapes* is almost sufficiently described by the figure. It has a head, neck, two branches, and a base, which, as has been already mentioned, fits into the fenestra ovalis. A minute muscle, the *stapedius*, takes its origin from a hollow conical eminence termed the *pyramid*, which lies behind the *fenestra ovalis*, and is inserted into the neck of the stapes; by pulling the neck backwards, it probably compresses the contents of the vestibule.

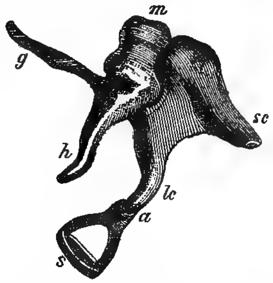


Fig. 2.

**Ossicles of the left ear, as seen from the outside and below.**

**m, head of the malleus; g, the slender process, or *processus gracilis;* h, the manubrium or handle; sc, the short crus, and lc the long crus of the incus; a, the position of the lenticular process, through the medium of which it articulates with the head of the stapes; s, the base of the stapes. Magnified three diameters.**

The Eustachian tube, into which the tympanic cavity opens anteriorly, is about an inch and a half in length, and passes downwards, forwards, and inwards to its opening in the pharynx. It is partly bony, but chiefly cartilaginous. Its use is to allow the free passage of air in and out of the tympanum, and to admit of the egress of the mucus secreted in that cavity.

The *internal ear* or *labyrinth* is the essential part of the organ of hearing, being the portion to which the ultimate filaments of the Auditory Nerve (q. v.) are distributed. It is composed of three parts—viz., the *vestibule*, the *semicircular canals*, and the *cochlea*, which form a series of cavities presenting a very complicated arrangement, and lying imbedded in the hardest part of the petrous portion of the temporal bone. They communicate externally with the tympanum by the two openings already described—the *fenestra ovalis*, and the *fenestra rotunda;* and internally with the internal auditory canal, which conveys the auditory nerve from the cranial cavity to the internal ear. The very dense bone immediately bounding these cavities is termed the *osseous labyrinth*, to distinguish it from the *membranous labyrinth*, which lies within a portion of it.

The *vestibule* is a common central cavity into which the semicircular canals and the cochlea open (see fig. 3, V). It is about a fifth of an inch in height, and in length from before backwards its transverse diameter (from side to side) being somewhat less. On its posterior wall are five orifices for the semicircular canals, one of the orifices being common to two of the canals. Anteriorly, the cochlea enters it by a single opening, the beginning of the *scala vestibuli.* On its outer wall is the fenestra ovalis, and on its inner are the *fovea hemispherica*, containing several minute orifices for the entrance of filaments of the auditory nerve, and the fovea semi-elliptica.

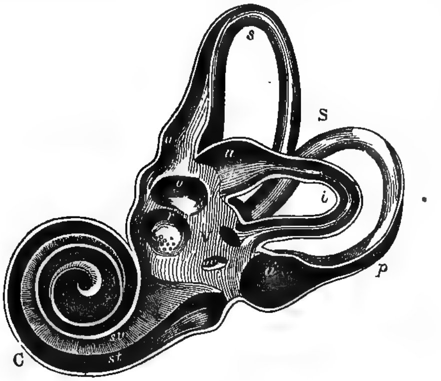


Fig. 3.

Interior of the Osseous Labyrinth :

V, vestibule; *av*, aqueduct of the vestibule; *o*, fovea semi-elliptica; *r*, fovea hemispherica; S, semicircular canals; *s*, superior; *p*, posterior; *i*, inferior; *a*, *a*, *a*, the ampullar extremity of each; C, the cochlea; *sv*, osseous zone of the lamina spiralis, above which is the scala vestibuli, communicating with the vestibule; *st*, scala tympani, below the spiral lamina. Magnified 3½ diameters.

The *semicircular canals* are three in number, and open at both ends into the vestibule. They vary in length, and notwithstanding their name, each is considerably more than a semicircle, the superior vertical canal being the longest. Their average diameter is about a twentieth of an inch, the extremity of each canal exhibiting a dilatation or *ampulla.* Each canal lies in a different plane, very nearly at right angles to the planes of the other two, hence their names of the *superior vertical*, the *inferior vertical*, and the *horizontal* canals.

The *cochlea*, which derives its name from its resemblance to a common snail-shell, forms the anterior portion of the labyrinth. It consists of an osseous and gradually tapering canal, about an inch and a half in length, which makes two turns and a half spirally around a central axis, termed the *modiolus*, which is perforated at its base for the entrance of the filaments of the cochlear portion of the auditory nerve. This spiral canal is about one-tenth of an inch at its commencement, and gradually diminishes towards the apex of the cochlea. At its base, it presents two important openings, one into the vestibule, and the other (closed by a membrane except in the dry bone), and communicating with the tympanum, being the *fenestra rotunda* already described. Its interior is subdivided into two passages (*scalæ*) by an osseo-membranous lamina, extending from the modiolus to the periphery, and taking the same spiral course as the canal itself. This is the *lamina spiralis*, which divides the cochlea into an upper passage, the *scala vestibuli*, and a lower one, the *scala tympani.* At the apex, these two passages communicate by an opening to which the term *helicotrema* has been applied. For a notice of the membranous portion of the *lamina spiralis*, we must refer to the article AUDITORY NERVE, where it is shewn that this structure must be regarded as the fundamental portion of the cochlea, being that on which the nervous filaments are spread out.

We now return to the *membranous labyrinth*, or the soft parts contained within the osseous vestibule and the semicircular canals. The membranous and osseous labyrinths have the same shape, but the former is considerably smaller than the latter, a fluid, termed the *perilymph*, intervening in some quantity between them. The vestibular portion consists of two sacs, an upper and larger one, of an oval shape, termed the *utriculus*, or *common sinus*, and a lower and smaller one of a more globular shape, called the *sacculus.*

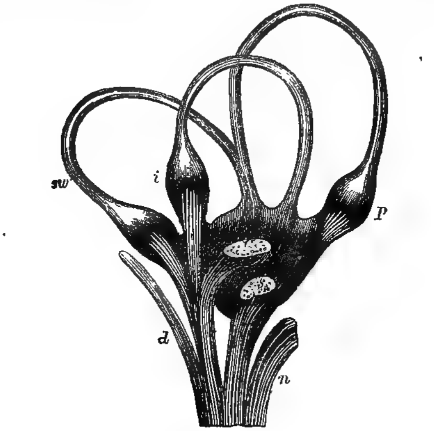


Fig. 4.

Membranous Labyrinth of the Left Side, with its Nerves and Otoliths.

*sw*, superior semicircular canal, with the ampulla and its nerve at one end, and the other end joined by *p*, the posterior canal, to form a common tube; *i*, inferior or horizontal canal, with the ampulla and its nerve at one end, and the other entering the utriculus separately; *c*, powdery otolith seen through the transparent wall of the utriculus or common sinus; *s*, powdery otolith of the sacculus, seen with its nerve in a similar way; *n*, cochlear division of the auditory nerve, cut through; *d*, *portio dura*, or facial nerve, leaving the auditory nerve, or *portio mollis*, to enter the aqueduct of Fallopius. Magnified.

The membranous semicircular canals resemble in form and arrangement the osseous canals which enclose them, but are only one-third of the diameter of the latter. The ultimate filaments of the Auditory Nerve (q. v.) mainly go (see fig. 4) to the utriculus, to the sacculus, and to the ampulla of the canals.

The membranous labyrinth is filled by a fluid which is termed the *endolymph;* and in certain spots, especially at the terminations of the vestibular nerves, we observe, both in man and the lower animals, calcareous matter either in a powdered or solid form. In man and mammals generally, and in birds and reptiles, it occurs as a powder, and is termed *otoconia* or *ear-powder*, and it always consists of carbonate of lime.

We now proceed to consider the different functions or offices of the various parts of the organ of hearing.

1. *Of the External Ear.*—A true auricle only exists in the mammalia, and in this class it varies from little more than an irregularly shaped cartilaginous disc, with little or no motion, as in man and the quadrumana, to an elongated funnel-shaped ear-trumpet, movable in all directions by numerous large muscles, as in the horse, the ass, and the bat.

The mode in which we see it employed by those animals in which it is highly developed, sufficiently indicates that its main function is to collect and concentrate the sounds which fall upon it. But the experimental investigations of Savart, with an apparatus constructed to resemble the tympanic membrane and the external auditory apparatus, shew that these parts are also adapted to enter into vibrations in unison with those of the air; and he suggested that the human auricle, by the various directions of different parts of its surface, could always present to the air a certain number of parts whose direction is at right angles with that of the molecular movement of that fluid, and therefore is the most favourable position for entering into vibrations with it.

2. *Of the Tympanum and its Contents.*—Savart's experiments shew that the membrane of the tympanum is thrown into vibration by the air, and that it always executes vibrations equal in number to those of the sonorous body which excites the oscillations in the air. He further ascertained that the malleus participates in the oscillations of the tympanic membrane, and that these vibrations are propagated to the incus and stapes, and thus to the membrane of the fenestra ovalis. The malleus has further the office of regulating, through the *tensor tympani* muscle, the tension of the tympanic membrane; and to allow of the motion necessary for this purpose, we find movable joints between it and the incus, and again between the latter bone and the stapes. The contraction of the stapedius muscle similarly modifies the tension of the membrane of the *fenestra ovalis;* and as compression exercised on this membrane extends to the perilymph, and is propagated through it to the *fenestra rotunda*, the tension of the membrane of the latter opening is also influenced by the muscle in question. The incus is much more limited in its motions than either of the other bones, and its use seems to be to complete the chain of ossicles in such a manner as to prevent any sudden or violent tension of the membranes, such as we can easily conceive might occur, if the conductor between the membranes were a single bone. The presence of air in the tympanic cavity serves a double purpose: in the first place, it preserves a uniform temperature on the outer surfaces of the fenestral membranes, and thus supports a fixed elasticity in them, which would not be the case if they were freely exposed to ordinary atmospheric changes; and secondly, the action of the chain of ossicles as conductors of sound is materially increased by their being completely surrounded by air, as is obvious from the first principles of acoustics.

3. *Of the Labyrinth.*—Sound is conducted to the labyrinth in three ways: first, by the chain of bones; secondly, by the air in the tympanic cavity; and thirdly, through the bones of the head.

Müller has shewn, by very ingenious experiments on an apparatus constructed to resemble, on a large scale, the middle and internal ear, that while the air in the tympanum conducts sound to the cochlea, through the *fenestra rotunda*, the chain of bones forms a much better conductor of it to the vestibule, through the *fenestra ovalis* (see the chapter on Hearing in his *Physiology*). Hence, we infer that the vestibule is adapted to receive sounds from the membrane of the tympanum and the external ear, while the cochlea, on the other hand, as its structure and connections indicate, may be regarded as that part of the labyrinth which is specially affected by sounds communicated through the bones of the head.

That the vestibule is the essential or fundamental part of the organ of hearing, is sufficiently proved by its constancy, other parts gradually disappearing as we descend the animal scale, and by its central position in the ears of the higher animals. The use of the otoconia or ear-powder is to strengthen the sonorous undulations, and to communicate to the membranous vestibule and ampullæ, and to their nerves, stronger impulses than the perilymph alone could impart. The action of otoliths or ear-stones, such as occur in osseous fishes, must be still more decided, and is well illustrated by the following experiment of Camper. Fill a bladder with water, and place a pebble in it. The slightest impulse communicated to the bladder disturbs the pebble, which consequently produces a greater impression on the hand supporting the bladder than the water alone could do.

Nothing certain is known regarding the functions of the semicircular canals, but their constant existence and number* in the vertebrated animals indicate their importance; and in most cases of congenital deafness they are more or less defective. The fact of their position corresponding with the three dimensions of a cube—namely, its length, breadth, and height—has led to the opinion that they are concerned in conveying a knowledge of the direction of sounds. This view is supported by Professor Wheatstone, who believes that we distinguish best the direction of those sounds which are sufficiently intense to affect the bones of the head, and that it is from the vibrations which are transmitted through these bones that our perception of direction is obtained. Thus, if the sound be transmitted in the plane of any one canal, the nervous matter in that canal will be more strongly acted on than in either of the other two; or if it be transmitted in a plane intermediate between the planes of this canal and the adjacent one, the relative intensity with which these two canals will be affected will depend upon, and indicate the direction of the intermediate plane.

The range of hearing, like that of vision, varies remarkably in different persons. Some persons are insensible to sounds which others can readily hear. The ordinary range of human hearing comprised between the lowest notes of the organ and the highest known sound emitted by insects includes, according to Wollaston, more than nine octaves, the whole of which are distinctly perceptible by most ears. He relates, however, several cases in which the range, in reference to the perception of high notes, was much less. In one individual, the sense of hearing terminated at a note four octaves above the middle E of the pianoforte, the F above it being inaudible, although his hearing in other respects was as perfect as that of persons in general; another case was that of a lady who could never hear the chirping of the field-cricket; and in a third case the chirping of the common house-sparrow could not be heard. See his Memoir on Sounds Inaudible by Certain Ears, *Phil. Trans.* 1820.

The sensation of sound, like that of light, frequently lasts longer than the exciting cause. We have familiar proof of this fact in the noise which remains in the ears after a long journey in a coach or railway; and it was clearly demonstrated by Savart, who found, in his experiments on toothed wheels, that the removal of one tooth did not produce any interruption of the sound.

For diseases of the ear, see Deafness.

**EAR**, in Music, is a figurative expression, meaning the possessing of a sensitive, just, and delicate appreciation of sound and measure.

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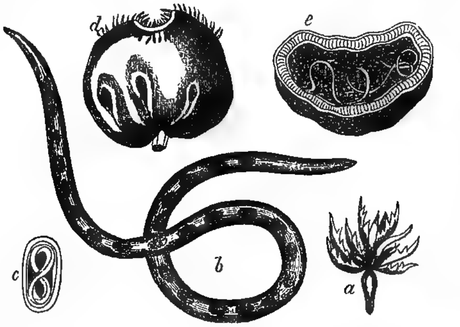
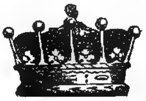
* The only exceptions that we can call to mind are those presented by the myxine or hag and the lamprey —the former has only one, the latter two, semicircular canals. Both are fishes of very low organisation.

**EA'R-COCKLES, PU'RPLES,** or **PE'PPER-CORN,** a disease in wheat, owing to the presence of *Vibrio tritici*, one of the *Infusoria*. This is an animal of worm-like form, yellowish-white, slender, tapering towards the tail, and more suddenly attenuated to a point at the head. Its minute eggs are supposed to be introduced into the sap of the wheat from infected seed, and so to find their way to the flowers, where they are hatched in the germen; the infected grains become dark green, then black, rounded like small pepper-corns, and furrowed on the surface; the glumes spread open, and the awns become twisted; the grains are filled with a white cottony substance, which at once dissolves in water, liberating the *Vibrio* in great numbers. Henslow calculates that 50,000 of the young *Vibrio* might exist in a grain of wheat. If the wheat is dried, the *Vibrio* becomes dormant, but retains its vitality in this state for six or seven years, and is ready to revive on the application of moisture.



Ear-Cockles:
*a*, diseased wheat; *b*, the vibrio, greatly magnified; *c*, its egg, with embryo; *d*, diseased germen of wheat; *e*, section of diseased germen of wheat, greatly magnified, shewing vibrios and their eggs.

**EARL** (Ang.-Sax. *eorl*—a corruption of *ealdor*). The distinctive name of the noble amongst the northern races was *eorl*, or *jarl*, as opposed to the mere freeman, the *ceorl*, or *karl;* from which latter name come the modern German word *kerl*, and the Scotch word *carl*. From indicating the whole noble class, the title of eorl among the Anglo-Saxons, and perhaps generally among the Teutonic nations, came at first probably to be limited to those who were *ealdors*, or *ealdormen*, by office—that is to say, to those who were appointed to be at once governors and judges over a certain district, and to whom, according to Kemble (*Saxons in England*, ii. p. 126), the titles of *dux*, *princeps*, and *comes* are indiscriminately applied by the Latin writers, the same officer being sometimes called by the one title, and sometimes by the other. Being thus limited to those who held the office of ealdors, the social not unnaturally came to be confounded with the official title, and hence the general error of tracing the word earl not to *eorl*, a noble, but to *ealdorman*, a title which Mr Kemble prefers to translate by duke. The early relation which subsisted between the duke and the count has been explained under the former title. In Europe generally, it was not till the count came to be recognised as a subordinate officer to the duke, governing a district of the province committed to the latter, that the earl assumed the position of the governor of a county, by the name of which he was commonly known. The title of duke, if it had ever existed, early disappeared in England, and was not revived till the time of Edward III. After the Norman Conquest, the French term count was substituted for earl; but it held its place only for a very short time as the title of the officer, though it has continued ever since to give a name to the district over which he presided, and a title to his wife. William the Conqueror, after the battle of Hastings, recompensed his chief captains by granting to them the lands and offices of the Saxon nobles; but by making the title of earl hereditary, he took, unintentionally perhaps, the first step towards changing it from a title of office to a title of dignity, and thus depriving it of substantial power. Deputies, *vice-comites*, or sheriffs, came necessarily to be appointed in all cases in which the earl was a minor, or otherwise incapacitated from discharging the duties of the office, till gradually the office itself passed to the deputy; the dignity alone, with the hereditary privilege of sitting as a legislator in the House of Lords, remaining with the principal. The form of creation of an earl formerly was by the king girding on his sword, and placing his coronet on his head, and his mantle on his shoulders; but earls are now created by letters-patent; and it is not unusual for them to depart so far from the old notion of their being territorial officers, as to take as their titles their own names, with the prefix earl—e. g., Earl Grey, Earl Spencer, Earl Russell, &c. At present, the number of earls, including the peerages of Scotland and Ireland, exceeds 200. See Peer.



Earl's Coronet.

The Earl's Coronet is a circle of gold, rising at intervals into eight pyramidal points, or spikes, on the tops of which are placed as many pearls, and which alternate with strawberry-leaves. See Crown.

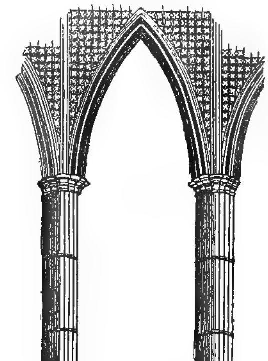
**EARL MA'RSHAL,** an office of great antiquity, and formerly of importance. There seems reason to believe that the Marshal of England, afterwards the earl marshal, was a distinct officer from the Marshal of the King's House, but the point is not altogether clear, and there is, consequently, some difficulty in determining which of the offices was held by the Mareschals, Earls of Pembroke. For many generations, the office has been hereditary in the family of the Dukes of Norfolk, though the earls marshal having, to an unusual extent, had the fate to die either childless or without heirs-male, the line of descent has been by no means a direct one. The last grant is by King Charles II., and bears date 19th October 1672. The earl marshal presided jointly with the constable over the Court of Chivalry (q. v.), the last proceedings of which are said to have taken place in 1631. He is the head of the College of Arms (q. v.), which has jurisdiction in descents and pedigrees; determines all rival claims to arms; and he grants armorial-bearings, through the medium of the kings-of-arms, to parties not possessed of hereditary arms. The office of the Lyon in Scotland is generally supposed to correspond to that of the earl marshal in England, but not quite correctly. The Lyon having been subordinate to the Marshal and Constable of Scotland, his office was more nearly that of the kings-of-arms in England; with this difference, that it extended to the whole kingdom.

**EA'RLOM,** Richard, an engraver, whose works in mezzotinto, published during the end of last and beginning of this century, are well known as amongst the best at the period when that kind of engraving was practised without the admixture of etching, adopted at the present time. His works after Reynolds, his plates from pictures in the Houghton Gallery and the *Liber Veritatis*, consisting of imitations of the celebrated drawings by Claude, in the possession of the Duke of Devonshire, are standard works in their various departments. He died in 1822, having some time previously retired from his profession.

**EARL'S PENNY**, an English corruption for Arles Penny. See EARNEST.

**EA'RLSTON**, or **ER'CILDOUNE**, a village in the south-west of Berwickshire, on the Leader, a north branch of the Tweed, 30 miles west-south-west of Berwick. Pop. (1861) 1829. E. has been and still is famed for its manufacture of ginghams; it has also a factory for the manufacture of blankets, tweeds, &c. On the left bank of the Leader are the ruins of a building called 'Rhymer's Tower,' as having been the residence of Thomas the Rhymer (q. v.), so famous in Scottish tradition. A mile south of E. is Cowdenknowes, which is celebrated in song for its 'bonny, bonny broom.'

**EARLY ENGLISH**, the term generally applied to the form of Gothic in which the pointed arch was first employed in this country. The early English succeeded the Norman towards the end of the 12th c., and merged into the Decorated (q. v.) at the end of the 13th. Its characteristics are beautiful and peculiar. Retaining much of the strength and solidity of the earlier style, it exhibited the graceful forms, without the redundancy of ornament which latterly degenerated into a fault in that which followed. Generally, it may be said to bear to the decorated something like the relation which an expanding rosebud bears to a full-blown rose. The windows are long and narrow, and when gathered into a group, are frequently surmounted by a large arch, which springs from the extreme moulding of the window on each side. The space between this arch and the tops of the windows is often pierced with circles, or with trefoils or quatrefoils, which constituted the earliest form of tracery. Each window, however, is generally destitute of any tracery in itself. 'The mouldings,' says Parker, 'in general consist of alternate rounds and deeply-cut hollows, with a small admixture of fillets, producing a strong effect of light and shadow.'—*Gloss. of Architecture.* From the same work we borrow the accompanying illustration of two very beautiful piers, surmounted by a lancet-shaped arch, and decorated in the manner peculiar to the style. They are from Westminster Abbey. Circular windows, however, still continued to be used, and trifoliated archways over doors are also to be found, as at Salisbury Cathedral. By far the most characteristic feature of the style is the Tooth-ornament (q. v.), which is often used in great profusion. Where foliage is used, it is cut with great boldness, so as to throw deep shadows, and produce a very fine effect. The under-cutting is often so deep as to leave nothing to connect the leaves with the mouldings but the stalks, and occasionally the edge or point of a leaf. The term Early English is said, by Parker, to have been introduced by Mr Millers in 1805. It corresponds to *Ogivale primitive* of French writers, and is very often known as the first pointed or lancet-arched amongst ourselves. See GOTHIC ARCHITECTURE.

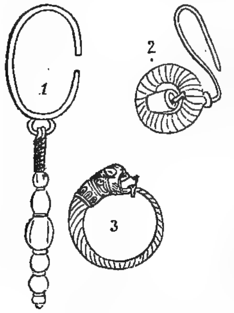


Early English Piers and Arch.

**EARN**, a river and loch in the south of Perthshire, in the finely-wooded, beautiful valley of Strathearn. Loch E. lies to the north of Ben Voirlich; its eastern extremity is 24 miles west of Perth. It is 7 miles long from east to west, 1 mile broad, and 100 fathoms deep, and is surrounded by bold and rugged hills. The river E. flows east from the loch 40 miles through the strath, past Comrie, Crieff, and Bridge of Earn, into the estuary of the Tay, 7 miles south-east of Perth. Along the river, near Abernethy, under a thick bed of clay, is a peat-bed 2 or 3 feet thick, supposed to be a continuation of the submarine forest at Flisk.—The Bridge of Earn, a much frequented village, stands on the right bank of the river, 6 miles south-south-west of Perth, and near the saline springs of Pitcaithly.

**EA'RNEST**, or **ARLES**, as it is called in Scotland, from the civil law word *arrhæ*, is a small sum of money which is given, or a simple ceremony, such as shaking hands, which is performed in proof of the existence of that mutual consent which constitutes a contract. In the first case, the earnest is said to be pecuniary; in the second, symbolical. It is not the earnest, but the consent, i. e., the agreement to a certain price, that is the root of the bargain; and the earnest thus becomes a mere adminicle of evidence, which may be dispensed with even in cases in which it is exacted by custom, if the parties choose to preserve other evidence of the completion of their bargain. The contracts in which earnest has been most frequently given both in this country and elsewhere, are sale and service. In the case of sale, it usually consists of a small sum paid by the buyer, by the acceptance of which the seller is held to bind himself to the sale; in the case of service, it is a small sum given by the master, in accepting which the servant becomes bound to serve. The question as to whether the earnest shall count as part of the price or wage depends on the intention of the parties, which, in the absence of direct evidence, will be inferred from the proportion which it bears to the whole sum. 'If a shilling be given,' as Mr Erskine says, 'in the purchase of a ship or of a box of diamonds, it is presumed to be given merely in evidence of the bargain, or, in the common way of speaking, is dead earnest; but if the sum be more considerable, it is reckoned up in the price.'—*Institutes*, b. iii. tit. iii. s. 5. The original view of earnest in England was, that it was a payment of a small portion of the price or wage, in token of the conclusion of the contract (Story on *Sales*, p. 216); and as this view seems to have been adhered to, the sum, however small, would probably there be counted as a part payment. There is only one decision under the 17th section of the statute of Frauds (29 Ch. II. c. 3), which provides that 'no contract for the sale of any goods, wares, and merchandises, for the price of £10 sterling, or upwards, shall be allowed to be good, except the buyer shall accept part of the goods so sold; and actually receive the same, or give something in earnest to bind the bargain, or in part payment.' The case referred to 'related to the purchase of a horse, where the purchaser produced a shilling from his pocket, and drew it across the hand of the seller's servant, and then returned it to his own pocket; and it was held that this act (which is a custom in the North of England, and is called striking a bargain) was not sufficient to satisfy the requisitions of the statute.'—Story, *ut sup.* From this decision it follows that no importance is attached in England to such fictitious ceremonies as the Jew plucking off his shoe and giving it to his neighbour, the Indian smoking his pipe, or the less poetical observance of thumb-licking, which Erskine tells us was common among the lower classes in Scotland in his day.

**EARRING.** A ring suspended from the ear, which is bored for the purpose. This mode of adorning the person has always enjoyed great favour amongst Orientals. By Persians, Babylonians, Lydians, Libyans, and Carthaginians, earrings were worn by both sexes. In the classical nations of antiquity, their use was confined to women. In the *Iliad* (xiv. 182, 183), Juno is represented as adorning herself with earrings made with three drops resembling mulberries. From this period down to the latest, the practice prevailed in Greece, and we find the ears of the Venus de Medici pierced for the reception of earrings. Pliny says (xi. 50) that there was no part of dress on which greater expense was lavished amongst the Romans; and Seneca mentions an earring, of which a drawing, copied in our illustration (fig. 1), is given in Smith's *Dictionary*, which he says was worth a patrimony. It has four pearls, two above and two below the precious stone in the centre. In the more valuable of the antique earrings, pearls were almost always used; and they were valued for the completeness of their form as well as for their whiteness. In place of a ring, the ornament was often attached to the ear with a hook (see fig. 2), a custom which still prevails in Italy. Many Egyptian earrings of very beautiful design have been preserved, of which fig. 3 is an example. These antique designs have been imitated in modern times, and if the use of an ornament which seems fitter for a South Sea islander than an English gentlewoman is to be continued, it can scarcely assume a more graceful form than was often given to it by the ancients. See Nose-ring. During the reigns of Elizabeth and James I., earrings were worn in England by men; a custom which is still continued by many sailors. Master Matthew, in *Every Man in his Humour*, says to Brainworm: 'I will pawn this jewel in my ear;' and Hall, in his *Satires* (B. vi. Sat. 1), speaks of the 'ringed ear' of the new-come traveller; and many similar passages to the like effect might be quoted. At the present day in England, earrings are worn only by women. The ears are bored usually at about seven years of age. The boring, which produces a temporary inflammation, acts as a counter-irritant in cases of sore eyes; and this is sometimes given as a reason for putting rings in the ears.



Ancient Earrings.

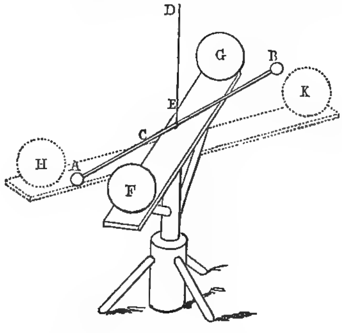
**EARS**, a term in Organ-building, given to small projecting pieces of metal on the sides of the mouths of metal pipes, put on for the purpose of assisting the pipes to speak promptly, especially when the organ is of small scale. The German name of 'beard' is fully more appropriate.

**EARTH**, The, the globe on which we live, being the third planet in order from the sun, and the largest within the belt of the Planetoids. We proceed to consider briefly the points of chief interest connected with it, and which do not fall to be treated under separate heads, viz., 1. Its form and magnitude; 2. Its mass and density; 3. Its motions; 4. Its temperature.

1. *The Form and Magnitude of the Earth.*—To a spectator so placed as to have an unobstructed view all round, it appears a circular plain, on whose circumference the vault of heaven seems to rest. Accordingly, in ancient times, even philosophers long looked upon the earth as a flat disc swimming upon the water. But many appearances were soon observed to be at variance with this idea, and even in antiquity, the spherical form of the earth began to be suspected by individuals. It is only by assuming the earth to be spherical, that we can explain how our circle of vision becomes wider as our position is more elevated; and how the tops of towers, mountains, masts of ships, and the like come first into view as we approach them. There are many other proofs that the earth is a globe. Thus, as we advance from the poles towards the equator, new stars, formerly invisible, come gradually into view; the shadow of the earth upon the moon during an eclipse is always round; the same momentary appearance in the heavens is seen at different hours of the day in different places on the earth's surface; and lastly, the earth, since 1519, has been circumnavigated innumerable times. The objection to this view that readily arises from our unthinking impressions of up and down, which immediately suggest the picture of the inhabitants of the opposite side of the earth—our *antipodes*—with their heads downwards, is easily got over by considering that on all parts of the earth's surface *down* is towards the earth's centre.

It is not, however, strictly true that the earth is a sphere; it is slightly flattened or compressed at two opposite points—the poles—as has been proved by actual measurement of degrees of latitude, and by observations of the pendulum. It is found that a degree of a meridian is not everywhere of the same length (see Degree of Latitude), as it would be if the earth were a perfect sphere, but increases from the equator to the poles; from which it is rightly inferred that the earth is flattened there. A pendulum, again, of a given length is found to move faster when carried towards the poles, and slower when carried towards the equator, which shews that the force of gravity is less at the equator than at the poles, or, in other words, that the centre, the seat of gravity, is more distant at the former than at the latter. The diminished force of gravity at the equator has, it is true, another cause, namely, the centrifugal force arising from the rotation of the earth, which acts counter to gravitation, and is necessarily greatest at the equator, and gradually lessens as we move northwards or southwards, till at the poles it is nothing. But the diminution of the force of gravity at the equator arising from the centrifugal force amounts to only $\frac{1}{289}$ of the whole force; while the diminution indicated by the pendulum is $\frac{1}{194}$. The difference, or $\frac{1}{580}$ nearly, remains assignable to the greater distance of the surface from the centre at the equator than at the poles. From the most accurate measurements of degrees that have been made, the flattening or ellipticity of the earth has been determined by Bessel at $\frac{1}{299\cdot153}$, or $\frac{1}{300}$ nearly; or, the equatorial radius is to the polar as 300 to 299. These measurements of degrees determine not only the shape but the size of the earth. Bessel's calculations give a geographical mile, or the 60th part of a mean degree of the meridian, at 951·807 toises (2029 yards, thus making the whole circumference 43,526,400 yards), and the equatorial and polar diameters at 6875·6 and 6852·4 geographical miles (7925·6 and 7899·14 English imperial miles). The surface of the earth contains nearly 150 millions of square geographical miles.

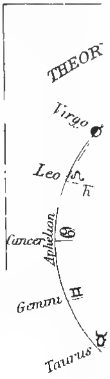
2. *The Mass and Density of the Earth.*—We have now seen that the earth is a sphere slightly flattened at its poles—what is called by geometers an elliptical spheroid—of a mean radius of somewhat less than 4000 miles. We have next to consider its mass and density. Nothing astonishes the young student more than the idea of weighing the earth; but there are several ways of doing it; and unless we could do it, we never could know its density. (1.) The first method is by observing how much the attraction of a mountain deflects a plummet from the vertical line. This being observed, if we can ascertain the actual weight of the mountain, we can calculate that of the earth. In this way, Dr Maskelyne, in the years 1774—1776, by experiments at Schehallien, in Perthshire—a large mountain mass lying east and west, and steep on both sides—calculated the earth's mean density to be five times greater than that of water. The observed deflection of the plummet in these experiments was between $4''$ and $5''$. (2.) In the method just described, there must always be uncertainty, however accurate the observations, in regard to the mass or weight of the mountain. The method known as *Cavendish's experiment* is much freer from liability to error. This experiment was first made by Henry Cavendish on the suggestion of Michel, and has since been repeated by Reich of Freyberg, and Mr Francis Baily. The apparatus used by Mr Baily is represented in the annexed figure. Two small balls at the extremities of a fine rod AB, are suspended by a wire DE, and their position carefully observed by the aid of a telescope. Large balls of lead, G, F, placed on a turning-frame, are then brought near them in such a way that they can affect them only by the force of their attraction. On the large balls being so placed, the small ones move towards them through a small space, which is carefully measured. The position of the large balls is then reversed (they are brought into the positions K, H), and the change of position of the small balls is again observed. Many observations are made, till the exact amount of the deviation of the small balls is ascertained beyond doubt. Then by calculation the amount of attraction of the large balls to produce this deviation is easily obtained. Having reached this, the next question is, what would their attraction be if they were as large as the earth? This is easily answered, and hence, as we know the attractive force of the earth, we can at once compare its mean density with that of lead. Mr Baily's experiments lead to the result that the earth's mean density is 5·67 times that of water. (3.) A third mode has lately been adopted by Mr Airy, astronomer-royal, by comparison of two invariable pendulums, one at the earth's surface, the other at the bottom of a pit at Harton Colliery near Newcastle, 1260 feet below the surface. The density of the earth, as ascertained by Mr Airy from this experiment, is between 6 and 7 times that of water; but for various reasons this result is not to be accepted as against that of the Cavendish experiment, and it is said that Mr Airy is himself dissatisfied with it, and means to repeat the experiment with new precautions. The density of the earth being known, its mass is easily calculated, and made a unit of mass for measuring that of the other bodies in the system. It is found that the mass of the earth compared with that of the sun is ·0000028173.



Baily's Apparatus.

3. *The Motions of the Earth.*—The earth, as a member of the solar system, moves along with the other planets round the sun from west to east. This is contrary to our sensible impressions, according to which the sun seems to move round the earth; and it was not till a few centuries ago that men were able to get over this illusion. See Copernican System. This journey round the sun is performed in about 365¼ days, which we call a year (solar year). The earth's path or orbit is not strictly a circle, but an ellipse of small eccentricity, in one of the foci of which is the sun. It follows that the earth is not equally distant from the sun at all times of the year; it is nearest, or in perihelion, at the beginning of the year, or when the northern hemisphere has winter; and at its greatest distance, or aphelion, about the middle of the year, or during the summer of the northern hemisphere. The difference of distance, however, is comparatively too small to exercise any perceptible influence on the heat derived from the sun, and the variation of the seasons has a quite different cause. The least distance of the sun from the earth is over 94 millions of miles, and the greatest over 96 millions; the mean distance is commonly stated at 95 millions of miles. If the mean distance be taken as unity, then the greatest and least are respectively represented by 1·01679, and 0·98321. It follows that the earth yearly describes a path of upwards of 596 millions of miles, so that its velocity in its orbit is about 99,000 feet, or 19 miles in a second.

Besides its annual motion round the sun, the earth has a daily motion or rotation on its axis, or shorter diameter, which is performed from west to east, and occupies exactly 23 hours, 56 minutes, 4 seconds of mean time. On this motion depend the rising and setting of the sun, or the vicissitudes of day and night. The relative lengths of day and night depend upon the angle formed by the earth's axis with the plane of its orbit. If the axis were perpendicular to the plane of the orbit, day and night would be equal during the whole year over all the earth, and there would be no change of seasons; but the axis makes with the orbit an angle of 23½°, and the consequence of this is all that variety of seasons and of climates that we find on the earth's surface; for it is only for a small strip (theoretically, for a mere line) lying under the equator that the days and nights are equal all the year; at all other places, this equality only occurs on the two days in each year when the sun seems to pass through the celestial equator, i. e., about the 21st of March and the 23d of September. From March 21, the sun departs from the equator towards the north, till, about June 21, he has reached a north



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declination of 23½°, when he again approaches the equator, which he reaches about September 23. He then advances southward, and about December 21 has reached a south declination of 23½°, when he turns once more towards the equator, at which he arrives, March 21. The 21st of June is the longest day in the northern hemisphere, and the shortest in the southern; with the 21st of December it is the reverse.

The velocity of the earth's rotation on its axis evidently increases gradually from the poles to the equator, where it is about equal to that of a musket-ball, being at the rate of 24,840 miles a day, or about 1440 feet in a second.

A direct proof of the rotation of the earth is furnished by its compression at the poles. There are indubitable indications that the earth was originally fluid, or at least soft; and in that condition it must have assumed the spherical shape. The only cause, then, that can be assigned for the fact that it has not done so, is its rotation on its axis. Calculation also shews that the amount of compression which the earth actually has, corresponds exactly to what its known velocity and mass must have produced. Experiments with the pendulum, too, shew a decrease of the force of gravity from the poles towards the equator; and though a part of this decrease is owing to the want of perfect sphericity, the greatest part arises from the centrifugal force caused by the motion of rotation. Another direct proof of the same hypothesis may be drawn from the observation, that bodies dropped from a considerable height deviate towards the east from the vertical line. This fact has been established by the experiments of Benzenberg and others. In former times, it was believed that if the earth actually revolved in the direction of east, a stone dropped from the top of a tower would fall, not exactly at the foot of the tower, but to the west of it. Now, as experience, it was argued, shews that this is not the case—that the stone, in fact, does fall at the bottom—we have here a proof that the pretended rotation of the earth does not take place. Even Tycho Brahé and Riccioli held this objection to the doctrine to be unanswerable. But the facts of the case were just the reverse. Newton, with his wonted clearness of vision, saw that, in consequence of the earth's motion from west to east, bodies descending from a height must decline from the perpendicular, not westward, but eastward; since, by their greater distance from the earth's centre, they acquire at the top a greater eastward velocity than the surface of the earth has at the bottom, and retain that velocity during their descent. He therefore proposed that more exact observations should be made to ascertain the fact; but it was not till more than a century afterwards that experiments of sufficient delicacy were made to bring out the expected result satisfactorily. It is difficult to find an elevation sufficiently great for the purpose, as several hundred feet give merely a slight deviation, which it requires great accuracy to observe. If a height of 10,000 feet could be made available, the deviation would be not less than 7½ feet. The analogy of our earth to the other planets may also be adduced, the rotation of which, with the exception of the smallest and the most distant, is distinctly discernible. Finally, an additional proof of the earth's rotation was lately given by Léon Foucault's striking experiment with the pendulum. The principle of the experiment is this: that a pendulum once set in motion, and swinging freely, continues to swing in the same plane, while at any place at a distance from the equator the plane of the meridian continues to change its position relative to this fixed plane.—The objection taken to the doctrine of rotation from the fact that we are unconscious of any motion, has little weight. The movement of a vessel in smooth water is not felt, though far less uniform than that of the earth; and as the atmosphere accompanies the earth in its motion, there is no feeling of cutting through it to break the illusion of rest.

If the turning of the earth on its axis is thus proved to be the cause of the apparent daily motion of the heavens, it is an easy step to consider the annual motion of the sun through the constellations of the zodiac as also apparent, and arising from a revolution of the earth about the sun in the same direction of west to east. If we consider that the mass of the sun is about 359,000 times greater than that of the earth, and that by the laws of mechanics, two bodies that revolve round each other, must revolve about their common centre of gravity, the idea of the sun revolving about the earth is seen to be simply impossible. The common centre of gravity of the two bodies being distant from the centre of each inversely as their respective masses, is calculated to be only 267 miles from the centre of the sun, and therefore far within his body, which has a diameter of 882,000 miles. But by help of a figure, it is easy to shew that the apparent motion of the sun on the ecliptic naturally arises from a motion of the earth about the sun. The motions of the planets also, that appear so complicated and irregular as seen by us, can only be satisfactorily explained by assuming that they too revolve round the sun in the same direction as the earth. See PRECESSION and NUTATION for an account of a small periodic motion of the earth's axis and its effects.

4. *The Earth's Temperature.* See METEOROLOGY and TEMPERATURE as to the phenomena of heat on the earth's surface. As we go below the surface, we reach a depth beyond which the interior of the earth seems to have no sympathy with the external causes of heat or cold, and its heat appears to be its own, and to increase according to a fixed law the deeper we descend. The average rate of observed increase is 1° F. for a descent of between 40 and 50 feet. If this law were universal—which we do not know it to be—at a depth of less than 30 miles the heat would be such as to hold in fusion all known substances, and the earth would have to be regarded as a very thin crust or shell full of molten liquid. This theory of a central heat obtained till lately extensive currency among philosophers, being endorsed with the names of Fourier and Humboldt; but it has recently been shewn by Mr W. Hopkins (see *Cambridge Essays* for 1858), that such thinness of crust is quite irreconcilable with the phenomena of Precession (q. v.). See also GEOLOGY. The fact is, that the law of temperature increasing as we descend has been inferred from far too few local observations, and most probably these may yet be explained by local causes.

**EARTHEN-WARE.** See POTTERY.

**EARTH-HOUSES, EIRD-HOUSES,** or **YIRD-HOUSES,** the name which seems to have been generally given throughout Scotland to the underground buildings, which in some places are called also 'PICTS' HOUSES' (q. v.), and in others, it would appear, 'Weems,' or caves. Martin, in his Description of the Western Islands, printed in 1703, when their use would appear to have been still remembered, speaks of them as 'little stone-houses, built under ground, called earth-houses, which served to hide a few people and their goods in time of war.' The earth-house, in its simplest form, is a single irregularly shaped chamber, from four to ten feet in width, from twenty to sixty feet in length, and from four to seven feet in height, built of unhewn and uncemented stones, roofed by unhewn flags, and entered from near the top by a rude doorway, so low and narrow that only one man can slide down through it at a time. When the chamber is unusually wide, the side-walls converge, one stone overlapping another, until the space at the top can be spanned by stones of four or five feet in length. In its more advanced form, the earth-house shews two or more chambers, communicating with one another by a narrow passage. There are instances in which one of the chambers has the circular shape and dome-roof to which archæologists have given the name of the 'BEEHIVE-HOUSE' (q. v.). Occasionally, as many as forty or fifty earth-houses are found in the same spot, as in the moor of Clova, not far from Kildrummy, in Aberdeenshire. They appear to have been almost invariably built in dry places, such as gravelly knolls, steep banks of rivers, and hill-sides. They are generally so near the surface of the ground, that the plough strikes upon the flagstones of the roof, and thus leads to their discovery. The object most frequently found in them is a stone quern, or hand-mill, not differing from that which continued to be used in remote corners of Scotland within the memory of living men. Along with the quern are generally found ashes, bones, and deers' horns; and more rarely small round plates of stone or slate, earthen vessels, cups and implements of bone, stone celts, bronze swords, gold rings, and the like. Occasionally, the surface of the ground beside the earth-house shews vestiges of what are supposed to have been rude dwelling-houses, and folds or enclosures for cattle. This, with other things, would indicate that the earth-houses of Scotland and Ireland (for they are found also in that island) were put to the same purpose as the caves which, as Tacitus (writing in the 2d c.) tells us, the Germans of his day dug in the earth, as storehouses for their corn, and as places of retreat for themselves during winter, or in time of war.

**EARTH-NUT**, a popular name of the tubers of certain umbelliferous plants, particularly *Bunium bulbocastanum* and *B. flexuosum*, which are common in most parts of Europe. Names of the same signification are given to them in a number of European languages. *Arnut*, *Yernut*, and *Jurnut*, Scotch and English provincial names, are corruptions of earth-nut. PIG-NUT is another common English name, pigs being very fond of these tubers, grubbing up the ground in quest of them, and soon becoming fat upon them. They are also called *earth-chestnut*, from their resemblance in taste and qualities to chestnuts, perhaps also from their resemblance in size, and their being black or very dark brown externally, and white within. By some they are preferred to chestnuts, and they are much used for food in different parts of Europe, and occasionally in some parts of England, either roasted or in soups. They are wholesome and nutritious; they form an article of trade in Sweden, and have sometimes been recommended as worthy of an attention which they have never yet received in Britain. The two species are very similar in general appearance, although *B. bulbocastanum* has by some botanists been referred to the genus *Carum* (Caraway), because its carpels have single vittæ between the ribs, whilst *B. flexuosum* has three. The former is also a plant of stouter habit. Both have umbels of small white flowers, much divided leaves with very narrow segments, and a single roundish tuber at the root of each plant. *B. flexuosum* is common in woods, pastures, waysides, &c., in most parts of Britain. *B. bulbocastanum* is found only in some of the chalk districts of England, but is abundant in many parts of Europe. *B. ferulaceum* likewise affords tubers, which are used as food in Greece.—The somewhat similar tubers of another umbelliferous plant, *Oenanthe pimpinelloides*, which grows in the pastures of some parts of the south of England, are sometimes also used for food, notwithstanding the very poisonous qualities of some of its congeners. See WATER-DROPWORT.—A Himalayan umbelliferous plant (*Chærophyllum tuberosum*), a species of Chervil (q. v.), yields edible tubers or *earth-nuts.*—The name E. is sometimes extended to other small tuberous roots of similar quality, although produced by plants widely remote in the botanical system, as *Apios tuberosa* and *Lathyrus tuberosus.* See APIOS and LATHYRUS.

**EARTHQUAKE**, the term applied to any tremor or shaking of the solid crust of the earth. The frequent occurrence of earthquakes, their destruction of life and property, their influence upon the solid surface of the earth, and the mysteriousness of their cause, force them upon our attention. It is estimated that 12 or 13 earthquakes, destructive more or less of life and property, occur every year, and it is well known that the surface of the globe is never free from sensible evidence of the continued operation of earthquake agency—that in some quarter or another tremors or slight shakings are always taking place. When these are of a serious nature, whole cities have been destroyed; fertile districts, with all their fruits and grain, have been laid waste; and enormous masses of human beings have lost their lives. No less than 60,000 perished in the great Lisbon earthquake; while in that of Calabria, in the end of last century, 40,000 were destroyed. It is estimated that as many as 13,000,000 of the human race have thus perished! The great changes which earthquakes produce on the earth's surface deserve the careful attention of the geologist. They disclose to him an agency which seems to have been at work during every period of the earth's history, and which has altered the earth's surface to an extent that can scarcely be imagined. The observed results of earthquakes which more immediately demand his attention are such as these: the new lakes and river-courses which they form, at the same time obliterating the old ones; the new valleys which they hollow out; the fissures of various sizes they form; and the immense landslips they frequently produce. But the mysterious nature of the producing cause of earthquakes is also a strong incentive to their study. It is unfortunately true, that the most popular scientific inquiries are those in which the imagination has large play: dry inductions from observed phenomena are not suited to the genius of popular modern science. Consequently, earthquakes, where every attempt at explaining their origin is theoretical, from the impossibility of obtaining direct observation, affording as they do a wide field for the play of the poetic faculty, find plenty of students.

No portion of the earth's surface is exempt from the influence of earthquakes. Egypt has been less visited than perhaps any other country, but even here we have the record of one which took place in 1740 A. D.; and Holland, with its loose alluvial deposits, has also felt their power. Nor is the bed of the ocean exempt; records of many subaqueous earthquakes exist, taken by vessels at sea, sometimes passing over the point of greatest disturbance at the moment of the shock. In like manner earthquakes have been active at every period of the earth's existence, breaking up its solid crust, elevating or depressing its surface, and doing as much as any other single agent to bring it into its present condition. They have been probably at some periods more active than at others, just as we find that some districts are now more liable than others to their visitation. So well defined, indeed, are the localities where earthquakes occur, that it is easy to exhibit their limits on a map. They are most frequent around the present lines or centres of volcanic action (see VOLCANO); and their frequency and violence seem to bear some relation to the activity and intensity of the associated volcanoes. Observers of volcanic phenomena have noticed that every great eruption, in whatever part of the world observed, and whether from a volcanic vent on land or beneath the ocean, is accompanied by earthquake shocks of greater or less violence and duration; while, on the other hand, those observing earthquakes speak of them as accompanied by volcanic eruptions, and of their often being stopped on the opening of volcanic vents. It is, however, an important fact that, although regions of active volcanic action are those of most frequent earthquake movements, yet the most violent earthquakes do not appear to have occurred in these regions, but, on the contrary, in districts lying some degrees away from the nearest volcanic action, as, for instance, in the famous earthquake of Lisbon. Districts in which there are extinct volcanoes are not more liable to such visitations than non-volcanic regions.

The phenomena connected with earthquakes have been variously described. Many writers refer to appearances in the heavens, or changes in the atmosphere, which to them seem to have some connection with the catastrophes they narrate. They tell of irregularities in the seasons preceding or following the shock, of sudden gusts of wind interrupted by sudden calms, of violent rains at unusual seasons, or in countries where such phenomena are almost unknown, of a reddening of the sun's disc, of a haziness in the air often continued for months, and similar phenomena. But these are so irregular in their appearance, and have been so seldom observed associated with more than a single earthquake, that, in the absence of any decided reason to the contrary, there seem good grounds for believing they have no real connection with the earthquake. It is different with underground noises, which frequently precede, accompany, or succeed the occurrence of earthquakes, or some of the shocks of them. They are undoubtedly intimately connected with the shock, yet earthquakes occur, even of the greatest violence, which are unaccompanied by any sound whatever. Different descriptions have been given of these subterranean noises. In some earthquakes, they are likened to chains pulled about, increasing to thunder; in others, the sound is like the rumbling of carriages, growing gradually louder, until it equals the loudest artillery; or like heavy wagons running away upon a road; or distant thunder; or like the hissing produced by the quenching of masses of red-hot iron in water; or like the rush of wind underground. As there have been earthquakes without subterranean noises, so there are frequently, in South America and elsewhere, underground sounds which are not followed by earthquakes.

The more intimate earthquake-phenomena are more uniform. Sometimes there is nothing else felt than a trembling or gentle motion of the surface, without producing any injury. In severe earthquakes, the almost invariable succession of phenomena is first a trembling, then a severe shock, or a succession of shocks, and then a trembling, gradually becoming insensible. The violent shocks are instantaneous, and very few in number, sometimes only one, usually not more than three or four. In the intervals between these, smaller shocks or tremblings take place. The severe shocks do the mischief. At the point or line of greatest disturbance, the shock has a distinctly vertical direction, coming from below upwards. As we leave this point, the direction of the motion becomes more and more horizontal, gradually also decreasing in intensity until it becomes insensible. This progressive movement is produced by an earth-wave or true undulation of the solid crust of the earth. The whole mass of the area is not moved at once, but only the wave-crest. In the case of the earthquake at Lisbon, the progress of the wave was roughly calculated; it was shewn to have had a very great velocity, and to have lasted only for an instant at any one spot. The area affected on this occasion was very extensive. The shock was felt on the one side as far as the southern shores of Finland, and on the other it reached beyond the St Lawrence in Canada, and was observed in some of the West India Islands—an area of no less than 7,500,000 square miles. The force required to move this must have been enormous, for, suppose the thickness of the earth's crust moved to have been no more than 20 miles, then 150,000,000 cubic miles of solid matter was moved. The influence of this earth-wave is communicated to the sea, when the earthquake is near the shore, or on the bed of the ocean. The sea swells, and slightly retires from the beach, and then a great wave rolls in upon the shore. At the Lisbon earthquake, this wave rose to a height of 60 feet at Cadiz. It carries with it sea-spoil, scattering it over the surface of the earth, far beyond the ordinary reach of the sea.

Of the various theories as to the nature of earthquakes, we can only refer to the most important. All theorists are agreed as to the connection between volcanoes and earthquakes; that they are produced by the same subterranean agency. The existence of a molten fluid mass in the centre of the earth, is the starting-point in all except the chemical theory propounded by Davy, which, though in the end abandoned by him, still finds supporters. When he discovered the metallic bases of the earths and alkalies, he threw out the idea that those metals might abound in an unoxidised state in the subterranean regions, to which water must occasionally penetrate. When this occurred, gaseous matter would be set free, sufficient to produce the earthquake, the metals would combine with the oxygen of the water, and heat enough would be evolved to melt the surrounding rocks.

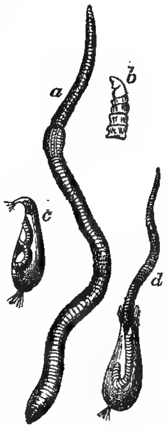
The internal molten mass being taken for granted, it is generally supposed that the generation of immense bulks of elastic gases, through the influence of this vast source of heat, would produce an explosion sufficient to account for earthquakes. Mr Mallet, in an elaborate report on the subject presented to the British Association, proposes an ingenious theory. He assumes that volcanoes, and the centres of earthquake disturbances, are near the sea, or other large supplies of water; and he says that when an irruption of igneous matter takes place beneath the sea-bottom, the first action must be to open up large fissures in its rocky material, or to lift and remove its incoherent portions, such as sand, mud, gravel, &c. The water on meeting the heated surfaces assumes the spheroidal state; while in this condition, the intestine motion may be great, but little steam is generated, and no impulses will be conveyed to a distance except only the tremblings which precede the shock; but no sooner have the surfaces cooled, than the water comes into close contact with them, and a vast volume of steam is evolved explosively, and blown off into the deep and cold water of the sea, where it is condensed, and thus a blow of the most tremendous sort is given at the volcanic focus, and being transferred outwardly in all directions, is transmitted as the earthquake shock. The surfaces of the ignited material, however, now cooled down below the point at which steam can be generated rapidly, merely keep up a gentle ebullition, which is transmitted as the trembling after the shock. On the surfaces again becoming heated by conduction from the molten mass, the various phases are again repeated. This he considers the chief cause of earthquakes, but he supposes they may also be due to the evolution of steam through fissures, and its irregular and *per saltum* condensation under pressure of sea-water; or to great fractures and dislocations in the rocky crust, suddenly produced by pressure acting on it from beneath, or in any other direction.

The latest, and perhaps in all respects the most satisfactory theory, is that proposed by the brothers Rogers, who consider the producing cause as an actual pulsation in the fluid matter beneath the crust propagated in the manner of great waves of translation, from enormous ruptures caused by tension of elastic matter, and floating forwards on its surface the superimposed rocky crust of the earth. This theory accords with the phenomena of earthquakes, and meets with a remarkable confirmation in the structure of certain mountain masses. See APPALACHIANS.

**EARTHS**, in Chemistry, are a class of substances regarded by the alchemists and older chemists as elementary, and which are insoluble in water. The earths *proper* are now known to be compound, consisting of a metal in combination with oxygen. The list includes Alumina, Glucina, Zirconia, Thoria, Didymia, Lantana, Ceria, Yttria, Terbia, Erbia. They do not alter vegetable colours, are soluble in acids, and are precipitated from their solutions by ammonia, potash, or soda. The *Alkaline Earths* have already been noticed. See ALKALIES.

**EARTHWORKS**, in Fortification, is a general name for all military constructions, whether for attack or defence, in which the material employed is chiefly earth. The word *earthwork*, however, has lately received a new importance, in reference to a discussion among military engineers, whether earthwork defences generally are better or worse than those of masonry. The subject cannot be discussed here, but its general character may be indicated. The fracture of the Russian granite fortifications at Bomarsund, and the obstinate defence made within the earthen defences at Sebastopol, led many writers, about the year 1855, to express a preference for earthworks instead of stoneworks. Mr J. Fergusson (*Portsmouth Protected*, 1856) has especially distinguished himself by his advocacy of this view. The reasons urged are—that masses of earth can be more quickly and cheaply put up than masses of masonry; that in most places earth is more readily obtained than stone; that if an earthwork be knocked to ruin by balls and shells, it can be repaired in a very short time; and that the defenders are not exposed to so much injury as in masonry-works, where splinters of stone fly about in a perilous way. Sir John Burgoyne, the leading military engineer in England at the present day, combats these views. He contends, among other things, that as a given amount of cannonading will make a much larger breach in earthwork than in stonework, the latter is best fitted to prevent capture by assault. He insists that earthworks should be regarded rather as temporary expedients than as purposed and permanent constructions; and he claims the authority of continental engineers in support of this opinion. See further under FORTIFICATION.

**EARTHWORM** (*Lumbricus*), a genus of *Annelida* (q. v.), of the order *Terricolæ*. There are many species, all of them pretty closely resembling in characters and habits the common E. or Dew-worm (*L. terrestris*), which is everywhere plentiful in Britain and throughout Europe, and is familiar to everybody. It has no head distinct from the body, no eyes, no antennæ, nor any organs external to the rings of which its body is composed, except minute bristles pointing backwards, of which each ring bears four pair, and which are of use in its locomotion. It sometimes attains to nearly a foot in length, and more than 120 rings have been counted in its body. The end at which the mouth is situated is pointed, and the tail is flattened, whilst the general form is cylindrical. The mouth consists merely of two lips, the upper lip elongated; there are no teeth nor tentacles, and the worm subsists by swallowing fine particles of the soil, from which its digestive organs extract the digestible matter, the rest being voided often in little intestine shaped heaps, called *worm-casts*, on the surface of the ground. The locomotion of the E. is effected by means of two sets of muscles, which enable it to contract and dilate its rings; its bristles preventing motion backwards, and the whole muscular effort thus resulting in progress; whilst the expansion of the rings, as it contracts the anterior segments, and draws forward the hinder parts, widens a passage for it through earth whose particles were close together before. Earthworms are thus of very great use, their multitudes continually stirring and loosening the soil through which they work their way; and moles, pursuing them to feed on them, stir and loosen it still more; whilst worm-casts gradually accumulate on the surface to form a layer of the very finest soil, to which it is supposed that the best old pastures in a great measure owe their high value.



Earthworm (*Lumbricus terrestris*):

*a*, earthworm; *b*, anterior extremity, shewing the mouth (the bristles are also shewn); *c*, egg, containing two young; *d*, young escaping from the egg.

Earthworms do not often visit the surface of the ground, except during night, and when the ground is moist. In the evening, during or after rain, or in the morning when the dew is abundant, they may sometimes be seen travelling about in great numbers. Both drought and cold cause them to retreat more deeply into the earth.—Their respiration is effected by means of little sacs, which communicate by minute pores with the external air. They are hermaphrodite, but mutual fecundation takes place by means of the thickened knot (*clitellum*) which is situated before the middle of their body. Their eggs often contain two embryos, and the young worms escape by a sort of valvular opening at the end.

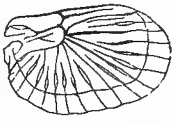
Besides their usefulness in the improvement of the soil, earthworms are of importance as food for birds, fishes, &c. Their value as bait for fishes is well known to every angler. The instinct which prompts them to hasten to the surface, when, in quest of bait, the angler shakes the soil with a spade or fork, is probably to be referred to the similar shaking on the approach of their constant enemy, the mole.

An E. of great size is common in the East Indies, wherever the climate is moist, from the Himalaya to Ceylon and Java. It is *Icthyophis glutinosus*, and abounds very much in that viscid secretion which in the common E. also forms a kind of protecting sheath for the animal, and smooths its way.

**EAR-TRUMPET**, a contrivance for improving the hearing of the partially deaf. For this purpose, many ingenious instruments have been devised. The principle in them all is the same: to collect the sonorous vibrations, and to convey them in an intensified form to the deeper parts of the ear. In this way, the hand placed behind the external ear constitutes the simplest form of ear-trumpet. Though, in a great number of cases of impaired hearing, there can be no doubt that much assistance and comfort are obtained from the use of one or other of the varieties of the ear-trumpet, still they must not be used indiscriminately, for in unsuitable cases they often do much mischief, both by increasing the deafness, and aggravating the noises in the head from which deaf persons often suffer so much. They are of most use, perhaps, in advanced cases of nervous deafness, though injurious in the early stages of this complaint; they are hurtful also in all acute diseases of the organ, and of little or no use in those cases of great thickening of the contents of the middle ear, where the adapting power of the organ has been lost. There are many varieties of trumpet in common use. By far the most useful and comfortable are those which are worn on the head, which go by the name of ear-cornets or acoustic auricles. They can be concealed under the hair or cap, and may be adapted to one or both ears by means of a spring over the head. The apparatus most commonly in use requires to be held in the hand, and consists of a narrow portion inserted into the ear-passage, and which gradually expands into a wide mouth; or the extremity of the instrument may be turned downwards, as in that form which passes by the name of Miss Martineau's trumpet. Another variety, applicable to the more severe cases of deafness, consists of an elastic tube, one end of which is tipped with ivory, and is placed in the ear of the patient; the other is held in the hand of the speaker, who applies his mouth to the open extremity. With this instrument, only one voice can be heard at a time. With the first-mentioned variety, general conversation can be heard often quite well. Ear-trumpets are generally made of some thin metallic substance, such as tin. Gutta-percha, vulcanite, and other substances, are also frequently used.

**EARWIG** (*Forficula*), a genus of orthopterous insects, recently subdivided into a number of genera, and forming the family *Forficulidæ*, which many entomologists constitute into a distinct order, *Dermaptera* (Gr. leather-winged). These insects indeed connect the true *Orthoptera* with the *Coleoptera*. Their legs are formed for running, and not for leaping; their wing-covers (*elytra*)—which are very small, and hide only a small part of the abdomen—are of firmer substance than in the other *Orthoptera;* the wings, of which there are two sets—hind and fore wings—are curiously folded under them, both longitudinally, in a fan-like manner, and transversely; the organs of the mouth resemble those of the true *Orthoptera*, with which also earwigs agree in the important character of *semi-complete* metamorphosis; the larvæ and pupæ much resembling the perfect insect, running about and feeding in the same manner, but the larvæ being destitute of wings and wing-covers, the pupæ having them only in a rudimentary state. Earwigs have the body narrow, and of nearly equal breadth throughout, the head exposed, the mandibles very strong and horny, the antennæ long and thread-shaped. The abdomen bears at its extremity a large pair of forceps, apparently of use as an instrument of defence. Earwigs abound in moist situations, as under the decayed bark of trees, under stones, among decaying straw, &c. They feed both on animal and vegetable food; the Common E. (*F. auricularia*), very abundant in Britain and in most parts of Europe, is troublesome to gardeners by eating the leaves of plants and the petals of fine flowers; but the injury which it does is probably more than compensated, particularly as to field-crops, by the destruction of multitudes of smaller insects, as *thrips*, *aphis*, &c. The appearance of this insect is by no means agreeable, and its mandibles and forceps are suggestive of unpleasant possibilities, which, however, would seem never to be realised, although it is a very frequent visitor of houses, particularly those of which the walls are covered with foliage. It is curious how extensively prevalent the notion is that earwigs creep into the ear. To this they owe their English name (E. from *ear*, and Sax. *wicga*, a worm or grub), and their names in many languages, as the French *Perce-oreille*, the German *Ohrwurm*, &c. Newman, in his *Introduction to the History of Insects*, says: 'The shape of these wings (the hind ones), when fully opened, is nearly that of the human ear; and from this circumstance it seems highly probable that the original name of this insect was ear*wing*.' The hind wing is here figured. It is agreeable to the general habits of the E. to creep into holes, yet there is apparently no authenticated instance of an E. entering the ear of a human being. Of their habit of creeping into holes, particularly to hide during the day, gardeners take advantage to make earwig-traps of different descriptions.

Earwig:
1, female sitting on her eggs; 2, young just emerged from eggs.

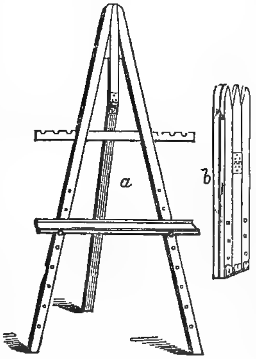


Hind Wing of Earwig, magnified.

An interesting peculiarity in the habits of these insects remains to be noticed. The female E. sits upon her eggs and hatches them like a hen; she also gathers her young ones around her and under her in the most affectionate manner. The observations of De Geer on this point have been confirmed by Mr Spence and others.

**EA'SDALE**, a small isle on the west coast of Argyleshire, in the Firth of Lorn, ten miles south-south-west of Oban. It contains one and a half square miles, and is situated in Kilbrandon parish. It is noted for its primary or metamorphic slate-quarries, belonging to the Marquis of Breadalbane. These quarries have been wrought for 150 years, and supply four or five millions of slates yearly. Compact felspar and conglomerate also occur in the isle.

**EASEL.** This structure, the object of which is to support the canvas or panel of the artist at a convenient height for work, has been used for ages pretty much in its present form.



Easel:
Of modern construction.
*a*, easel open for use; *b*, easel folded up.

**EASEMENT**, in English Law, has been defined to be 'a privilege without profit, which the owner of one neighbouring tenement hath of another, existing in respect of their several tenements, by which the servient owner is obliged "to suffer or not to do" something on his own land for the advantage of a dominant owner.'—Gale on *Easements.* The rights comprehended under the title of easements are of a very important kind; they include rights of water, rights of way, rights to light and air, rights to support from a neighbouring soil or house, rights to carry on an offensive trade, &c. An easement is an incorporeal Hereditament (q. v.), and corresponds in many respects with a Servitude (q. v.) in Scotch law. But an easement is more limited than a servitude, inasmuch as it comprehends those rights only which carry no title to the profit of the soil. These latter rights are in England known as Profits *a prendre* (q. v.). An easement cannot exist apart from an estate in land, it being necessary that there should be two tenements, the one enjoying the right (dominant), the other over which it is enjoyed (servient). An easement must be constituted by deed or by Prescription (q. v.). It may be extinguished by an actual or implied release. When a party entitled to the enjoyment of an easement is disturbed in that enjoyment, he may enforce his right by action at law, or he may enter upon the servient tenement, and abate the nuisance himself. The American law on the subject of easement is regulated by the same principles that prevail in England. See Kent's *Commentaries on American Law.*

**EAST** (Ger. *Ost;* allied probably to Greek *eōs*, the morning, and Lat. *oriens*, the rising, i. e., sun) is, vaguely speaking, that quarter of the horizon where the sun rises, or which a person with his face to the south has on his left hand. It is only at the equinoxes that the sun rises exactly in the east point. A line at right angles to the meridian of a place points exactly east and west. See MERIDIAN and HORIZON.

From very early times, the east has been invested with a certain sacred character, or at least held in respect over other points of the compass. It was the practice of the ancient pagans to fix their altar in the eastern part of their temples, so that they might sacrifice towards the rising sun, which in itself was an object of worship. The custom of venerating the east was perpetuated by the early Christian church from various circumstances mentioned in the sacred record. For example: 'The glory of the God of Israel came from the way of the east.'—Ezek. xliii. 2. 'There came wise men from the east to Jerusalem.'—Matt. ii. 1. 'And, lo, the star, which they saw in the east, went before them.'—Matt. ii. 9. Tradition heightened respect for the east. It was said that Christ had been placed in the tomb with his feet towards the east, and that at the day of judgment he should come from the eastward in the heavens. Looking towards the sun in the east in praying or repeating the creed, was thought to put worshippers in remembrance that Christ is the sun of righteousness, and such an attitude was accordingly adopted as an aid to devotion. From these various circumstances, the building of churches with the Chancel (q. v.) to the east, bowing to the east on uttering the name of Jesus, and burying with the feet to the east, were introduced as customs in the church. In recent times, there has been a general disregard to the practice of turning formally with the face to the east on repeating the creed, and, as is well known, the attempt to revive it by a party in the English church has caused considerable dispeace. It is a curious instance of the inveteracy of popular custom, that in Scotland, where everything that savoured of ancient usage was set aside as popish by the reformers, the practice of burying with the feet to the east was maintained in the old churchyards, nor is it uncommon still to set down churches with a scrupulous regard to east and west. In modern cemeteries in England and Scotland, no attention appears to be paid to the old punctilio of interring with the feet to the east, the nature of the ground alone being considered in the disposition of graves.

**EAST CAPE**, the name of the most easterly headlands of the island of Madagascar, of the North Island of New Zealand, and of Siberia or Asiatic Russia. The *first* is in lat. 15° 20′ S., and long. 50° 15′ E.; the *second* in lat. 37° 40′ S., and long. 178° 40′ E., being almost precisely the antipodes of Carthagena in Spain; and the *third* is that extremity of the Old World which is nearest to the New, being separated by Behring's Strait (q. v.) from Cape Prince of Wales in America. It is in lat. 66° 6′ N., and long. 169° 38′ W.; or rather, to follow the natural reckoning, 190° 22′ E.

**EAST INDIA ARMY.** When the East India Company (q. v.) first sent factors or agents to India, an army was not thought of. Military forces arose out of the exigencies of the times. Some of the first troops in the Company's pay were mere adventurers; some were liberated convicts; some deserters from European armies. Gradually, organisation was introduced, and improved arms furnished. As the power of the Company increased, natives entered the battalions; until at length most of the troops were Hindus or Mohammedans, drilled by non-commissioned officers sent out from England. A few regiments were raised in England; a much larger number were raised in India; but all alike were officered by the Company's favoured English officers, largely paid, and having many opportunities for making rapid fortunes. The ranks were filled by enlistment; the Company never compelled the natives to become soldiers; the pay offered was always such as to induce a sufficient number of men to enter. Their periods of leave of absence were liberal; and after a certain number of years' service, they retired on a pension sufficient to support them for the remainder of their days.

At the period immediately preceding the outbreak of the Revolt in 1857, the army in the pay of the Company comprised about 24,000 royal troops (lent to, and paid for by, the Company); 18,000 European troops, raised and drilled by the Company in England; 180,000 native regulars; and 60,000 native irregular horse—making about 280,000 in all. This large force was irrespective of 40,000 contingents furnished by dependent native princes, and of the native armies belonging to the independent and semi-dependent princes. The Company's troops formed three distinct armies, each under its own commander-in-chief, and each stationed in one particular presidency. In these three armies, three kinds of troops—Europeans, native regulars, and native irregulars—had their own special organisation. In order to secure unity of action when necessary, it was customary to give the commander-in-chief of the Bengal army precedence over those of Madras and Bombay; he was, in effect, commander-in-chief of the whole of the Company's forces. There were too few English officers with the native regiments, and these, in most cases, knew too little of the men under their command. This was not the *cause* of the Revolt in 1857, but it was one of the circumstances that led to the rapid spread of the Revolt when once begun. To what extent this fine army melted away during 1857 and the two following years, is described under INDIA. Speaking generally, it may be said that the armies of the Madras and Bombay presidencies remained faithful, especially the infantry. It was in the Bengal army that the disruption chiefly occurred. The irregulars, both cavalry and infantry, raised amongst the Sikhs and Punjabees, were in almost every case faithful.

In August 1858, the act which transferred the government of India from the Company to the crown received the royal assent. The army was transferred as well as the political power. As the Sikhs had behaved well, most of the regiments from that quarter were retained, as well as most of the native regiments in the Bombay and Madras presidencies; but it was not deemed expedient to restore the native regiments of Bengal proper, which had proved so treacherous. In that year, at the suggestion of Earl Canning, a committee was appointed to inquire into the whole circumstances relating to the reorganisation of the army. The Company originated the inquiry, but the commissioners did not make their Report till after the transfer of the Company's powers to the crown. Although the commissioners' Report was presented in the summer of 1859, very little was effected during the remainder of that year, or in 1860, to reorganise the Indian army; matters were kept together in a provisional way. Meanwhile, when the European troops of the Company's army were turned over to the crown, a disturbance, amounting almost to a mutiny, occurred. The men claimed that, as they had enlisted into the Company's service, they ought not to be transferred without their own consent asked, or without receiving a bonus on re-enlisting. To prevent a dangerous excitement, the government allowed such as chose to retire.

In 1861, the Secretary of State for India brought forward a measure for reorganising the Indian army, which has been passed into a law. The *British* portion of the Indian army is to form part of the Queen's army generally, with certain honorary distinctions, and is to take its turn at home and in the colonies like the rest; but the expenses are to be paid out of Indian, not imperial revenues. The *native* portion is to be managed wholly in India; in its reconstruction, many improvements are made, to lessen the chances of future revolt. A majority of the officers educated and commissioned by the Company having suffered greatly by the Revolt, certain compensatory advantages have been conceded to them under the new system.

**EAST INDIA COMPANY.** On the 31st December 1600, a charter was granted by Queen Elizabeth to a number of London merchants, under the title of 'The Governor and Company of Merchants of London trading to the East Indies.' From the time when Vasco de Gama effected the eastern passage to India, by doubling the Cape of Good Hope, in 1497, the Portuguese carried on an extensive trade with that country, unaffected by rivals until nearly a century afterwards, when the Dutch and the English began to compete with them. This competition became formidable when two 'East India Companies' were established, one at Amsterdam, and one in London. It is of the latter of these that we here treat. The charter was exclusive, as is usual in such cases; prohibiting the rest of the community from trading within the limits assigned to the Company. Those limits were enormous, comprising the whole space, land and sea, between the Cape of Good Hope and Cape Horn, or the whole of the Indian and Pacific Oceans. The charter was for fifteen years. The Company speedily sent out ships to Java and Sumatra, which returned with calicoes, silk, indigo, and spices. It was then determined to make some kind of settlements on the coast of Hindustan itself; and about 1612, the Company obtained permission from the native princes to establish factories or agencies at Surat, Ahmedabad, Cambay, and Gogo.

The Company's charter was renewed from time to time, with various modifications, but not without much contention and difficulty. Gradually establishments were formed in Java, Sumatra, Borneo, Celebes, Malacca, Siam, the Banda Islands, and other places in the East; as well as on the Coromandel and Malabar coasts of India itself. The first beginning of Madras dates in 1640, of Calcutta in 1645, and of Bombay in 1665, as chief establishments of the Company. In 1662, Charles II. gave them permission 'to make war and peace on the native princes'—a privilege of which they largely availed themselves for nearly 200 years.

In 1698, the crown granted a charter to a *new* E. I. C., who offered a loan of £2,000,000 to the state; but this naturally led to wranglings, and the two companies were united into one by an act of parliament passed in 1702. The constitution then established was maintained with little alteration as long as the Company existed. Every shareholder who held £500 of the Company's stock became a member of the Court of Proprietors; and this court had legislative functions in all that related to the Company's affairs. The proprietors annually chose 24 to form a Court of Directors, from those of their number who held not less than £2000 of stock. Six of the directors went out of office every year; they retired in rotation, so that each had four years of office. It was a general custom with the proprietors to elect the same persons as directors over and over again. The Court of Proprietors was to meet once a year, or oftener if necessary; the Court of Directors as often as the directors chose, provided 13 were present. Theoretically, the constitution of the Company was very democratic; but practically the affairs were in the hands of the directors; for the proprietors took little other interest than in receiving their half-yearly dividends. The proprietors had from one to four votes each, according to the amount of stock held by them. The Board of Control, of later formation, bore relation to the governmental affairs of India.

Properly speaking, the Company were only merchants: sending out bullion, lead, quicksilver, woollens, hardware, and other goods to India; and bringing home calicoes, silk, diamonds, tea, porcelain, pepper, drugs, saltpetre, &c., from thence. Not merely with India, but with China and other parts of the East, the trade was monopolised by the Company; and hence arose their great trade in China tea, porcelain, and silk. By degrees, avarice and ambition led the Company, or their agents in India, to take part in the quarrels among the native princes; this course gave them power and influence at the native courts, from whence arose the acquisition of sovereign powers over vast regions. India thus became valued by the Company, not only as commercially profitable, but as affording to the friends and relations of the directors opportunities of making vast fortunes by political or military enterprises. It is not the purpose of the present article to trace the political affairs of the Company, or the rise of a British empire in India; that will be done under INDIA, BRITISH; it will suffice here merely to state, that no *national* or *patriotic* motive marked the beginning of this course.

In 1744, the Company obtained a renewal of their charter till 1780, but not without a loan of £1,000,000 to government; for the monopoly was distasteful to the nation at large. France, too, had an E. I. C., and the struggles between the two companies for power in the southern part of India, led to constant warfare between them during the remainder of the century. Other loans to government were the means of obtaining further renewals of the charter in later years. In 1833, the legislature took away all the *trading* privileges of the Company. The dividends to proprietors of East India stock were thenceforward to be paid out of taxes imposed by the Company on the people of India, in such provinces as were under British dominion. From that year the Company's powers became anomalous; the Company could not *trade*, and could not *govern* without the sanction and continued interference of the imperial government. The wars in India, since that year, have been waged by England as a nation, rather than by the Company; and England practically, though not nominally, became responsible for the enormous cost of those wars. In 1853, the charter was again renewed, with a further lessening of the power of the Company, and an increase of that of the Crown.

Had not the Indian Revolt occurred in 1857, the last charter would have remained in force until 1873; but that gigantic calamity led to the resolution—a resolution the wisdom of which was disputed by many of the best judges of Indian affairs—of concentrating the power in the hands of the imperial government. In spite of a strenuous resistance, in 1858, the Company were forced to cede their powers, by an act which received the royal assent on the 2d of August. The charter of 1853 had provided that £6,000,000 of India stock should have 10½ per cent. dividend *guaranteed* by England out of the revenues of India; and that parliament should redeem this stock at cent. per cent. premium any time after the year 1873. The act of 1858, therefore, contained due clauses for carrying out these provisions, and transferred the whole of the Company's powers to the Crown.

The Company still (1861) exists, but for little other purpose than that of receiving and distributing dividends. Most of the distinguished men, military and political, lately in the Company's service, accepted office under the Crown, to assist the government by their general knowledge of Indian affairs. The East India House in Leadenhall Street has been sold; the affairs of India are managed by a Secretary in Council at the west end of London; the valuable Library and Museum of the Company have passed over to the Crown; and little is now left save a memory of the past to denote the once mighty East India Company.

**EAST INDIES**, as distinguished from *West Indies*, include not merely the two great peninsulas of Southern Asia, but likewise all the adjacent islands from the delta of the Indus to the northern extremity of the Philippines. They thus extend, to use round numbers, in latitude from 35° N. to 10° S., and in E. long. from 65° to 130°. At one time, the name of India had, towards the east, a still wider application, occasionally comprising Japan, nay, everything in that direction except China alone. See INDIA.

**EAST MAIN**, the most easterly portion of the Hudson Bay Territories, is bounded on the north by Hudson's Strait, and on the west by Hudson's Bay down to its southern extremity, meeting Labrador on the east, and Canada on the south. This immense region, at least thrice as large as Great Britain, is generally bleak and sterile, yielding little to commerce but fish-oil and a few furs.—A river of the same name, otherwise called the *Slade*, crosses the southern section of the country, entering Hudson's Bay, here known as James's Bay, about lat. 52° 15′ N., after a course of 400 miles.

**EAST RIVER**, the strait between Long Island Sound and New York Harbour. It is 20 miles long, separating New York City on the west from its suburbs, Williamsburg and Brooklyn, on the east. Its narrowest part is the Hurlgate or Hellgate, which is about the middle of its course. Here the rocks, which once obstructed the passage, have been removed by blasting. The name—clearly a misnomer for an arm of the sea—is convenient as contrasted with the North River, or Hudson, and may have arisen from the river-like action of the tides—an action so powerful as to have here and there materially deepened the channel.

**EASTBOURNE**, a rising watering-place in the south-east of Sussex. It lies in a chasm between two cliffs, one of which, 3 miles to the south-south-east, forms Beachy Head. In the vicinity are fine drives and walks. It has a martello tower and a fort. Pop. of parish (1861) 5785. E. is supposed to have been of Roman origin, and remains of a Roman villa, bath, and tesselated pavements have been found here.

**EASTER** (Ger. *ostern*, Fr. *paque*, Scot. *pasch*, from Gr. *pascha*, the passover), the festival of the resurrection of Jesus Christ, derives probably its Teutonic name from the festival of the goddess Ostara, in Ang.-Sax. Eastre, which the Saxons of old were wont to celebrate about the same season at which the Christian festival of Easter occurs. In the ancient church, the celebration of Easter lasted eight days. After the 11th c., however, it was limited to three, and in later times, generally to two days. It was formerly the favourite time for performing the rite of baptism. The courts of justice were closed, and alms dispensed to the poor and needy, who were even feasted in the churches—a custom which led to much disorder. Slaves also received their freedom at that season; and as the austerities of Lent were over, the people gave themselves up to enjoyment; hence the day was called the 'Sunday of joy' (*Dominica gaudii*). To the popular sports and dances were added farcical exhibitions, in which even the clergy joined in some places, reciting from the pulpits stories and legends, with a view to stir the hearers to laughter (*risus paschalis*). Against this indecency, the Reformers of the 16th c. loudly and successfully raised their voices. During the whole week before Easter—that is, in the interval between Palm Sunday and the beginning of the Easter festival—daily services were held. See PASSION WEEK and GOOD FRIDAY.

On Easter day, the people saluted each other with the Easter kiss, and the exclamation *Surrexit* (He is risen); to which the reply was *Vere surrexit* (He is risen indeed). The chief solemnity always consisted of the celebration of the Lord's Supper.

The proper time for the celebration of Easter has occasioned no little controversy. In the 2d c., a dispute arose on this point between the Eastern and Western Churches. The great mass of the Eastern

Christians celebrated Easter on the 14th day of the first Jewish month or moon, considering it to be equivalent to the Jewish Passover. The Western churches celebrated it on the Sunday after the fourteenth day, holding that it was the commemoration of the resurrection of Jesus. The Council of Nice (325 A. D.) decided in favour of the Western usage, branding the Eastern usage with the name of the 'quartadeciman' heresy. This, however, only settled the point that Easter was to be held, not upon a certain day of the month or moon, but on a Sunday. The proper astronomical cycle for calculating the occurrence of the Easter moon was not determined by this council. It appears, however, that the Metonic Cycle (q. v.) was already in use in the West for this purpose; and it was on this cycle that the Gregorian Calendar, introduced in 1582, was arranged. The method on which this calendar is constructed is too complex for description here. An elaborate account of the whole matter was published by Professor De Morgan in the *Companion to the British Almanac* in 1845, and to this the reader is referred. The time of Easter being the most ancient and important of all the movable feasts of the Christian Church, determines all the rest. It was debated, at the time of the introduction of the Gregorian Calendar, whether Easter should continue to be movable, or whether a fixed Sunday, after the 21st of March, should not be adopted. It was deference to ancient custom that led the ecclesiastical authorities to adhere to the method of determination by the moon. It must be remembered, however, that it is not the actual moon in the heavens, nor even the mean moon of astronomers, that regulates the time of Easter, but an altogether imaginary moon, whose periods are so contrived that the new (calendar) moon always follows the real new moon (sometimes by two, or even three days). The effect of this is, that the 14th of the calendar moon—which had, from the times of Moses, been considered 'full moon' for ecclesiastical purposes—falls generally on the 15th or 16th of the real moon, and thus after the real full moon, which is generally on the 14th or 15th day. With this explanation, then, of what is meant by 'full moon,' viz., that it is the 14th day of the calendar moon, the rule is, that Easter Day is always the first Sunday after the paschal full moon, i. e., the full moon which happens upon or next after the 21st of March (the beginning of the ecclesiastical year); and if the full moon happens upon a Sunday, Easter Day is the Sunday after. For any given year, the day on which the paschal full moon falls, and then Easter Day, are found by the following table and rule—

| Days of the Month. | Dom. Letter. | Golden Number. | Days of the Month. | Dom. Letter. | Golden Number. |
|---|---|---|---|---|---|
| March 21 | C | 14 | April 9 | A | 15 |
| " 22 | D | 3 | " 10 | B | 4 |
| " 23 | E | ... | " 11 | C | ... |
| " 24 | F | 11 | " 12 | D | 12 |
| " 25 | G | ... | " 13 | E | 1 |
| " 26 | A | 19 | " 14 | F | ... |
| " 27 | B | 8 | " 15 | G | 9 |
| " 28 | C | ... | " 16 | A | ... |
| " 29 | D | 16 | " 17 | B | 17 |
| " 30 | E | 5 | " 18 | C | 6 |
| " 31 | F | ... | " 19 | D | ... |
| April 1 | G | 13 | " 20 | E | ... |
| " 2 | A | 2 | " 21 | F | ... |
| " 3 | B | ... | " 22 | G | ... |
| " 4 | C | 10 | " 23 | A | ... |
| " 5 | D | ... | " 24 | B | ... |
| " 6 | E | 18 | " 25 | C | ... |
| " 7 | F | 7 | | | |
| " 8 | G | ... | | | |

First ascertain the Dominical Letter (q. v.)—taking the second, where there are two—and the Golden Number (see EPACT); look for the golden number in the third column of the table, and opposite to it stands the day of the full moon; then look for the dominical letter, next after the day of full moon, and the day standing opposite the dominical letter is Easter Day. It sometimes happens that Easter Day, as thus determined, is different from what it would be if by 'full moon' were understood the astronomical full moon. Thus, in 1818, Easter Day, by the calendar, fell, and was celebrated on the 22d of March, the earliest possible day, although the full moon was on that day; and in 1845, it again fell on the day of the actual full moon (the 23d March).

One object in arranging the calendar moon was, that Easter might never fall on the same day as the Jewish Passover. They did occur together, however, in 1805, on the 14th of April; and in 1825, on the 3d April; and will do so again in 1903, on the 12th April; in 1923, on the 1st April; in 1927, on the 17th April; and in 1981, on the 19th April. The Jewish festival usually occurs in Passion week, and never before the 26th of March, or after the 25th of April (new style). On the other hand, the Christian festival is never before the 22d of March, or after the 25th of April. In 1761 and 1818, Easter fell on the 22d of March; but neither in this nor the following century will such be the case again. In 1913, it will fall on the 23d of March, as it did in 1845 and 1856. The latest Easters in this century and the following, occur in 1886 and 1943, on the 25th of April. In 1848, Easter fell on the 23d of April; and in 1859, on the 24th of April.

*Popular Observances.*—Many of the popular observances connected with Easter are clearly of pagan origin. The goddess Ostara or Eastre seems to have been the personification of the morning or east (q. v.), and also of the opening year or spring. The Anglo-Saxon name of April was Estormonath; and it is still known in Germany as Ostermonath. The worship of this being seems to have struck deep root in Northern Germany, and was brought into England by the Saxons. It continued to be celebrated in many parts in the north of Germany down to the beginning of the present century, by the kindling of bonfires and numerous other rites. See BELTEIN. Like the May observances of England, it was especially a festival of joy. With her usual policy, the Church endeavoured to give a Christian significance to such of the rites as could not be rooted out; and in this case, the conversion was particularly easy. Joy at the rising of the natural sun, and at the awaking of nature from the death of winter, became joy at the rising of the Sun of Righteousness—at the resurrection of Christ from the grave. The bonfires can be traced in the great 'paschal tapers,' sometimes weighing 300 lbs., with which the churches were lighted on Easter Eve. In the ancient church disbursements of St Mary-at-Hill, in the city of London, there is even an entry 'For a quarter of coles for the hallowed fire on Easter Eve, 6*d*.'

The most characteristic Easter rite, and the one most widely diffused, is the use of *Pasch* (i. e., Easter) *eggs*. They are usually stained of various colours with dye-woods or herbs, and people mutually make presents of them; sometimes they are kept as amulets, sometimes eaten; games are also played by striking them against one another. In some moorland parts of Scotland, it used to be the custom for young people to go out early on 'Pasch Sunday' and search for wild-fowls' eggs for breakfast, and it was thought lucky to find them.

There can be little doubt that the use of eggs at this season was originally symbolical of the revivification of nature—the springing forth of life in spring. The practice is not confined to Christians; the Jews used eggs in the feast of the Passover; and we are told that the Persians, when they keep the festival of the solar new year (in March), mutually present each other with coloured eggs.

From the Christian point of view, this 'Feast of Eggs' has been usually considered as emblematic of the resurrection and of a future life.

**EASTER ISLAND**, originally DAVIS'S LAND, is a detached spot on the Pacific, in lat. 27° 20′ S., and long. 109° 30′ W. It is of volcanic origin, rising 1200 feet above the sea; and it is moderately fertile, but almost destitute of water. With a circumference of 30 miles, it is estimated to have 2000 inhabitants. It belongs to the Polynesian archipelago, of which it forms the south-easterly extremity. The language of the inhabitants is radically the same as that of Tahiti; and their religion likewise has manifestly come from the west. E. I. presented, in the days of Cook and La Perouse, an incredible number of rude sculptures, formed apparently of an easily-cut volcanic product; but as these works could not be found by Kotzebue, their disappearance has perhaps been owing to the same softness of material which had facilitated their execution.

**EASTER OFFERINGS**, or **EASTER DUES**, small sums paid to the parochial clergy in England by their parishioners at Easter, as a compensation for personal tithes, or the tithe for personal labour.

**EASTER TERM**, LEGAL. For a general history of the law terms in England, see LAW TERMS. Easter Term was formerly dependent upon the movable feast of Easter, and was hence called a movable term. It commenced on the Wednesday fortnight after Easter Sunday, and lasted till the following Monday three weeks. But by 11 Geo. IV. and 1 Wil. IV. c. 70, amended by 1 Wil. IV. c. 3, Easter Term now begins on 15th April and ends on 8th May. If any of the days between the Thursday before and the Wednesday after Easter fall within term, no sittings in Banc (q. v.) are held on those days, and the term is prolonged a corresponding number of days.

**EASTLAKE**, SIR CHARLES LOCK, President of the Royal Academy of London, was born at Plymouth in 1795, educated at the Charter-house in London, and entered as a student at the Royal Academy. Subsequently, he went to Paris, where he studied and copied the great paintings then collected in the Louvre. The return of Napoleon from Elba compelled him to leave France. He went back to his native town, and supported himself by portrait-painting. When the *Bellerophon*, with Napoleon on board, appeared in the port of Plymouth, E. profited by the opportunity, and produced his first important picture, 'Napoleon at the Gangway of the *Bellerophon*, attended by some of his Officers.' In 1817, Sir Charles visited Italy and Greece, sketching assiduously in both countries. During a residence of several years in Rome, he executed his 'Girl of Albano leading a Blind Woman to Mass,' 'Isidas the Spartan,' 'Pilgrims arriving in Sight of Rome,' and many others, illustrative of Italian customs and scenery. In 1827 he was elected an Associate, and in 1830 a full member of the Royal Academy. His 'Greek Fugitives Prisoners to Banditti,' &c., added to his already great reputation; and in 1841 appeared what many conceive to be his master-piece, 'Christ lamenting over Jerusalem.' It was immensely admired, the duplicate painted for Mr Vernon being reckoned one of the most valuable pictures in the Vernon Gallery. 'Hagar and Ishmael' was exhibited in 1844; 'Heloise' in 1845; 'The Escape of Francesco Novello di Carrara with Taddea d'Este, his Wife, from the Duke of Milan,' in 1850; 'Beatrice' in 1855, &c. In 1850, he was elected President of the Royal Academy, when he received the honour of knighthood. Subsequently, he was appointed Director of the National Gallery, in which capacity his services have been of the highest importance; for besides its improved arrangement, many of the most valuable specimens of the best schools have been added to the collection. Sir Charles has also acquired a high reputation as a writer on art. In 1847, he published *Materials for the History of Oil Painting*, a work of great learning and research. He has contributed several articles to the *Penny Cyclopædia* on subjects belonging to his profession, and executed a translation of Goethe's *Farbenlehre*. In 1853, he received the title of D.C.L. from the university of Oxford.—LADY EASTLAKE (born Elizabeth Rigby) is an artist of no mean power, and also has distinguished herself as an authoress by her *Letters from the Baltic*, and her articles on subjects connected with art in the *Quarterly Review*.

**EASTON**, a flourishing town of Pennsylvania, in the United States, stands in the fork between the rivers Delaware on the east and Lehigh on the west, about 20 miles above the head of navigation on the united streams. Though the place is thus far cut off from the sea, yet, for internal trade, it clearly occupies a commanding position. Its natural advantages, too, have been largely improved. To say nothing of railways, E. is the common terminus of three canals—one of 60 miles, down on the right side of the Delaware as far as Bristol; another of 84 miles, along the Lehigh, into the great coal-field of the state; and the third of 102 miles, leading across the country to Jersey City. Within the immediate neighbourhood, likewise, iron ore and limestone abound. Having an unlimited supply of water-power, the town is the seat of extensive manufactories. Pop. in 1860, 8944.

**EASTPORT**, a garrison-town of Maine, in the United States, is situated on one of the small islands of Passamaquoddy Bay, which receives the St Croix, the international boundary during its whole course between the United States and British America. On the coast, therefore, E. may be said to be the frontier town of the Union towards the north-east. Its harbour is deep enough for the largest vessels. The tide rises within it to a height of 25 feet—a height far exceeded in many other parts of the Bay of Fundy, of which Passamaquoddy Bay is an inlet. The place is largely engaged in the fisheries and in ship-building. The population is about 5000.

**EAU CRÉOLE**, a very fine liqueur, made in Martinique, by distilling the flowers of the Mammee Apple (*Mammea Americana*) with spirit of wine.

**EAU DE COLO′GNE**, a celebrated perfume, invented long ago by the Farina family in Cologne, and since manufactured chiefly by members of the same family. It is also made in France. It consists principally of spirits of wine, along with numerous essential oils harmoniously mingled together, so as to produce a refreshing and grateful scent. The recipe said to be followed in the manufactories at Cologne is twelve drops of each of the essential oils neroli, citron, bergamot, orange, and rosemary, along with one drachm of Malabar cardamoms, and one gallon rectified spirit. The whole is distilled together, and the condensed liquid constitutes Eau de Cologne.

**EAU DE JAVELLE** is a solution of hypochlorite of potash, which, when administered to man, is stated to act powerfully on the nervous system, and to give rise to general rigidity, and even to cause tetanic spasms.

**EAU DE VIE.** See Brandy.

**EAUX BONNES,** a fashionable watering-place of France, in the department of Basses-Pyrenees, is situated 20 miles south-south-east of Oloron. It stands in a narrow gorge surrounded with rocks, and consists of a street of about 30 large and well-built hotels and lodging-houses. On the opposite side of the street there is an open space laid out as a shrubbery, and planted with trees; it is called the Jardin Anglais. E. B. is much frequented on account of its hot sulphureous springs, which are four in number, and are used for bathing purposes. Their temperature does not exceed 91° F. There is also a cold spring here, which is used for drinking. The springs are said to be very valuable, on account of their power of checking the progress of incipient consumption, and of curing various affections of the lungs and chest. The season of the E. B. lasts from June to October, and during that time it is crowded with visitors and patients.

**EAUX CHAUDES,** Les, three miles south-west of the preceding, is a similar place of resort. Its springs have the same properties as those of the Eaux Bonnes.

**EAVES,** in Architecture, the edge of a sloping roof which overhangs the wall, for the purpose of throwing off the water. When there is no concealed gutter at the margin to conduct the water to spouts or pipes, but the water is allowed to run from the roof to the ground, they are called *Dripping Eaves.*

**EAVESDRIP,** or **EAVESDROP** (Ang.-Sax. *yfesdrype*). 'The owner of a private estate,' says Kemble (*Saxons in England*, vol. i. p. 45), 'was not allowed to build or cultivate to the extremity of his own possession, but must leave a space for eaves. The name for this custom was yfesdrype.' The space was regulated by the charter by which the property was held. In a charter of 868 A. D., it is limited to two feet. This Saxon custom corresponded to the well-known urban servitude of the Romans called stillicide (*stillicidium*). The eavesdrop was the water which dropped from the projecting roof, and in this sense is opposed to the water collected in a spout, to which the Romans gave the name of *flumen.* Similar regulations existed in Greece, and have probably existed in all countries.

**EAVES-DROPPERS** 'are such as listen under walls or windows, or the eaves of houses, to hearken after discourse, and thereupon to frame slanderous or mischievous tales.'—Blackstone's *Comm.* iv. 168. Such persons are, by the law of England, regarded as common nuisances: they may be indicted at the sessions, and on conviction, are punishable by fine. Persons who by their conduct expose themselves to suspicion of an intention to commit this offence, may be brought before a magistrate, and required to give security for their good behaviour; 34 Edw. III. c. 1. See Hawk., P. C., I. 62, sec. 4.

**EBB AND FLOW.** See Tides.

**EBENA'CEÆ,** a natural order of exogenous plants, consisting of trees and shrubs, with alternate leathery leaves, and axillary flowers, which are monopetalous, somewhat leathery, and generally unisexual; the fruit fleshy. They have not a milky juice. They are regarded as allied to *Aquifoliaceæ* (Holly, &c.), *Apocynaceæ*, and *Oleaceæ.* About 160 species are known, mostly tropical, but a few are natives of Europe, and other temperate countries. The wood is in general remarkable for its hardness, as the different kinds of Ebony (q. v.) and other species of *Diospyros;* and on account of this quality, even that of species which never attain the ordinary size of timber trees is sometimes accounted valuable, as of *Royena lucida*, the African Bladder-nut or Zwart-bast, at the Cape of Good Hope; where also that of *Euclea undulata*, a hard brown wood, is esteemed for cabinet-work. The fruit of many species is eatable. See Date Plum. The fruit of *Embryopteris gelatinifera* contains a viscid juice, and is used in all parts of India for paying boats.

**E'BERHARD,** Aug. Gottlob, a well-known German author, was born at Belzig in 1769, studied at Leipsic and Halle, and first attracted attention by his contributions to a periodical devoted to *belles-lettres*, entitled *Ida's Blumenkörbchen* (Ida's Flower-basket). Among his numerous works may be mentioned *List um List, oder was ein Kuss nicht vermag* (Trick for Trick, or what could not a Kiss do); *Ysop Lafleur's Sämmtliche Werke* (Ysop Lafleur's Collected Works); *Ferdinand Werner, der Arme Flötenspieler* (Ferdinand Werner, the poor Flute-player); and *Ischarioth Krall's Lehren und Thaten* (Iscariot Krall's Doctrines and Doings); *Hannchen und die Küchlein* (Jenny and the Chickens), a narrative poem in ten parts, which has gone through many editions, and been often translated into other languages; and *Der erste Mensch und die Erde* (The First Man and the Earth), a poem marked by simple dignity and lively representation. E., after a life of hard literary work, died at Dresden, 13th May 1845.

**E'BERHARD,** Johann August, a philosophical writer of Germany, was born at Halberstadt, 31st August 1739; studied theology at Halle, 1756—1759; and after spending several years as a preacher in Berlin and Charlottenburg, became Professor of Philosophy at Halle in 1778, and Doctor of Theology in 1808. He died 6th January 1809. E.'s first work was his *Neue Apologie des Socrates* (New Apology of Socrates), 2 vols., Berlin, 1772; a work in which the rights of common sense are vindicated against the accusations of a narrow theology. It was received with much applause both in Germany and in other countries. Among his other writings may be mentioned, *Sittenlehre der Vernunft* (Ethics of the Reason), Berlin, 1781; *Theorie der schönen Künste und Wissenschaften* (Theory of the Fine Arts and Sciences), Halle, 1783; *Allgemeine Geschichte der Philosophie* (Universal History of Philosophy), Halle, 1788; *Handbuch der Aesthetik* (Manual of Æsthetics), 4 vols., Halle, 1803—1805; and *Versuch einer allgemeinen Deutschen Synonymik* (An Attempt towards a Complete Work on German Synonyms), 6 vols., Halle, 1795—1802, a work which was enriched and improved by Maas, 1818—1821, and again by Gruber, 1826—1830, but which was, at the time of its appearance, the best thing of the kind in the German language. Towards the close of his life, E. struggled, but without success, against the speculative excesses of the new schools of philosophy headed by Kant and Fichte. E. was a clear and sensible thinker, as well as an agreeable and interesting writer.

**E'BERNBURG,** a small town in the Bavarian Palatinate, is situated about 20 miles south-west of Mayence, at the junction of the Alsenz with the Nahe. It is notable on account of the ruins of its castle, which formerly belonged to the famous knight Franz of Sickingen, who was a devoted friend of the early reformers. His stronghold, which was once considered almost impregnable, afforded a secure retreat from danger and persecution to Melancthon, Bucer, Œcolampadius, and Ulrich von Hutten, the last of whom composed several of his works here. After the death of Sickingen, the castle of Ebernburg was besieged and dismantled by the Electors of Hesse and of Treves. Pop. 483.

**EBERT**, KARL EGON, a Bohemian poet, was born at Prague, 5th June 1801; educated there and at Vienna; and after filling several situations, finally settled in Prague, where he still resides. His chief works are his *Dichtungen* (Poems), 2 vols., Prague, 1824; 3d edition, Stutt. 1845; *Wlasta, ein Böhmisch-nationales Heldengedicht in drei Büchern* (Wlasta, a Bohemian National Heroic Poem, in three Books), Prag. 1829; and *Das Kloster, idyllische Erzählung in fünf Gesängen* (The Cloister, a Narrative Idyll, in five cantos), Stutt. 1833. These poems, especially the last two, are marked by a noble lyrical vehemence, as well as by purity and elegance of language. They were received with great applause, particularly in Bohemia, whose national traditions form their groundwork. One peculiarity of E.'s compositions, is their happy union of the German and Czech characteristics. E. has also written a large number of dramas, which, however, possess little dramatic or other merit.

**E'BIONITES** (Heb. *ebion*, poor), a name probably given originally by the hierarchical or influential party among the Jews, to those of their countrymen who professed the Christian faith, and who generally belonged to the *poorer* and more ignorant class (John, chap. vii., verses 48, 49). Subsequently, it would seem, the Gentile Christians, who were ignorant of Hebrew, employed it in a distinctive sense to designate their Jewish co-religionists, who, in addition to their belief of Christianity, observed the Mosaic law. Irenæus is the first writer who makes use of the name. It is highly probable that the E. first became an organised body or sect at Pella, a city in Peræa, on the eastern side of the Jordan, whither they had betaken themselves on the breaking out of the Roman-Jewish war in the time of Hadrian. Here, indeed, a strictly Jewish-Christian church continued to exist down to the 5th century. Among the E., however, there was by no means a unanimity of religious feeling, or uniformity of opinion. Two great divergent parties are clearly recognisable—the E. proper, and the Ebionitic Nazarenes. The former were little different from Jews: their conceptions of the Saviour were meagre and unspiritual. They believed that Jesus was simply a man distinguished above all others for *legal* piety—pre-eminently a *Jew*, and selected as the Messiah because of his superior Judaism. Of course they denied his supernatural birth, yet not his resurrection; for 'they lived in expectation of his speedy return to restore this city of God (Jerusalem), and to re-establish the theocracy there in surpassing splendour.'—Neander. They were the genuine descendants of those Judaisers who plagued the church in the time of the Apostle Paul. The Ebionitic Nazarenes, on the other hand (who at the close of the 4th c. seem to have dwelt chiefly about Berœa in Lower Syria, but at an earlier period may have been more widely diffused), were Jewish Christians, in the better sense of the term. They conceived it to be their *own* duty still to circumcise, keep the Sabbath, &c., but they had no wish to impose the peculiarities of Judaism on the Gentile Christians. They did not believe that Christianity was merely a glorification of Judaism, but a new life come into the world, in which the Gentile might at once participate, without undergoing a Mosaic ordeal. Like the stricter E., they used a *Gospel of Matthew;* but it contained what the other did not—an account of the supernatural conception and birth of the Saviour. According to Neander, who has very thoroughly investigated this question, there were a great many varieties of opinion among the E., springing out of the differences above spoken of, which it would be tedious to record. It is sufficient to say that *Essenism* (q. v.) modified Ebionism greatly, through the introduction of a Jewish mysticism, which recognised in Moses and Christ an inward identity of doctrine, and regarded them as revealers of the 'primal religion,' whose teaching, however, had been sadly corrupted. It is extremely probable that an Essenic Ebionite wrote the *Clementine Homilies.* See CLEMENS.

**E'BOLI** (ancient *Eburi*), a small town of Southern Italy, in the Principato Citeriore, about 16 miles east-south-east from Salerno, is picturesquely situated at a considerable elevation above sea-level. The climate, which does not become too cold in winter, notwithstanding the position of the town, is very unhealthy in summer, owing to the number of streams in the neighbourhood. There is an annual fair at E., which lasts 12 days. Pop. 7300.

**E'BONY** (Lat. *ebenum;* but originally from the Eastern name), a wood remarkable for its hardness, heaviness, and deep black colour, is the heart-wood of different species of *Diospyros*, of the natural order *Ebenaceæ*, the same genus which produces the Date Plum (q. v.), Kaki, and other fruits. The best E., excelling in uniformity and intensity of colour, is the produce of *D. Ebenum*, which grows in great abundance in some of the flat parts of Ceylon, and is a tree of such magnitude, that logs of its heart-wood, two feet in diameter, and varying from ten to fifteen feet in length, are easily procured. *D. melanoxylon*, the E. tree of Coromandel, yields E. of good quality; *D. tomentosa, D. Roylei*, and other Indian species, also yield it. In Mauritius and Madagascar, E. of very good quality is produced by *D. reticulata.* Other species of *Diospyros* are much valued for their beautiful timber, very different in colour from E., as Calamander Wood (q. v.) and Cadooberia (*Diospyros Ebenaster*). The last-named species is found in India and Ceylon. The prevailing black of the wood is beautifully striped with a rich yellowish-brown; but in density and durability it is far inferior to ebony.—E. is chiefly used by cabinet-makers for veneering. The ancient Greeks and Romans were acquainted with it; and it is supposed that they obtained it either from India or Madagascar. They frequently inlaid it with ivory, for contrast of colour. It is mentioned by Ezekiel (xxvii. 15) as an article of Tyrian commerce. It was at one time used in medicine, as a

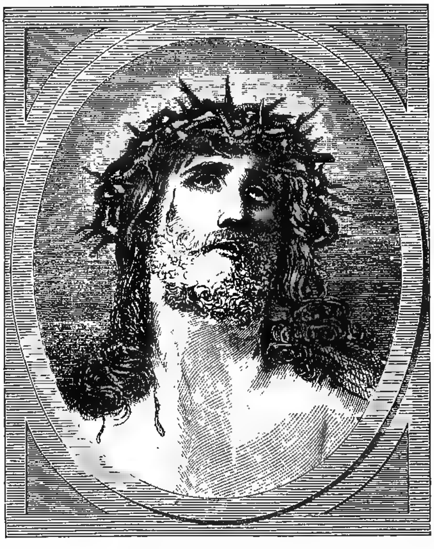
Ebony (*Diospyros Ebenum*).

laxative and sudorific; it has a somewhat pungent taste.—The name E. is sometimes given to the black wood of trees very different from those of the genus *Diospyros*. An Abyssinian tree called Mozzungha (*Fornasinia*), of the order *Leguminosæ*, produces a black heavy wood, much resembling ebony.—West Indian E. or American E., is produced by *Brya ebenus*, also of the natural order *Leguminosæ*, but the wood is of a greenish-brown rather than a black colour. It receives a good polish, is very hard and durable, and much sought after by musical instrument-makers. It is one of the articles of export from the West Indies to Britain. But the tree is of small size, seldom more than 12 feet high, and the trunk only a few inches in diameter.

**E'BRO** (Lat. *Iberus*), an important river of Spain, rises in the province of Santander, at a point greatly elevated above the level of the sea, about 12 miles north-west of Reynosa, flows south-east for about 25 miles; then east past Frias, after which it maintains a general south-east course, passing Miranda, Haro, Logroño, Tudela, and Zaragoza, when it turns north, passes Mequinenza, flows south-east to Mora, south to Tortosa, and finally east to the Mediterranean, into which it falls after a course of about 350 miles. Its mouth is choked up with sand, and, to render it navigable, a canal called the San Carlos has been carried through the delta. Its principal affluents are the Najerilla, Jiloca, and Guadalope from the right, and the Aragon, Gallego, and Segre from the left. The course of the E. is chiefly through narrow, and sometimes rocky valleys; and its bed is characterised by many shoals and rapids which interrupt the navigation. This is partly remedied, however, by means of the Imperial Canal, which extends from the vicinity of Tudela to a point 40 miles below Zaragoza.

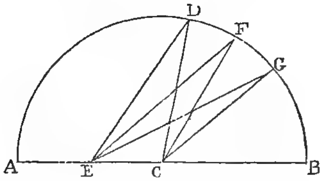
**ECBA'TANA** (Agbatana, Achmĕta, Hagmatana), the ancient capital of Media, situated at a distance of 12 stadia (about 1½ mile) from Mount Orontes, the modern Elwend. Its foundation was attributed by popular belief to Solomon or Semiramis, while the book of Judith ascribes it to Arphaxad (Phraortes?), and Herodotus to Deioces (728 B. C.). It lay upon a conical hill, crowned by a temple of the Sun, and was enclosed by seven concentric walls, the innermost of which was gilded, and the next plated with silver; while the rest, in their order outwards, were painted orange, blue, scarlet, black, and white, respectively. As they rose in gradation towards the centre, all the battlements with their gorgeous hues—probably representing, in Sabæan fashion, the seven planetary spheres or the seven climes—were visible at once. The city is reported to have been 250 stadia in circumference. Its principal buildings were the citadel—a stronghold of enormous dimensions, where also the archives were kept, in which Darius found the edict of Cyrus the Great concerning the rebuilding of the temple in Jerusalem—and the royal palace. Cedar and cypress only were used for the woodwork, and the ceilings, beams, and rafters were overlaid with gold and silver. The mild climate and the magnificence of its structure singled out E. as the favourite summer residence, first of the Median, then of the Persian, and, lastly, of the Parthian monarchs. After the battle of Arbela (331 B. C.), Alexander followed Darius thither, and secured an immense booty. It was again pillaged by the Seleucidæ; but such were the riches of this place, that Antiochus the Great still found 4000 talents' worth of silver to carry away. E. subsequently fell into the hands of the Parthians; and it has since so utterly sunk into decay, that notwithstanding the frequent mention that is made of it both in the Bible and in classical writings, its very site can no longer be fixed with certainty. Gibbon and Jones tried to identify it with Tabriz or Tauriz; Williams, with Ispahan; while recent explorers, such as Rennell, Mannert, Kinneir, Morier, and Ker Porter, generally agree that the present Hamadan, with the supposed tombs of Mordechai and Esther (see Hamadan), occupies the site of ancient Ecbatana. Sir Henry Rawlinson assumes two Ecbatanas, one the present Hamadan, the other the present Takhti-Suleiman, 36° 25′ N. lat., 47° 10′ W. long. Both the orthography of the scriptural Achmĕta, and the cuneiform Hagmatana in the Behistun Inscriptions, which, by changing the *m* into *b*, became Agbatana in Greek, seem to point to Hamadan. Broken columns, a few cuneiform inscriptions, coins, medals, and a fragmentary stone lion, placed there, according to the Eastern legend, by the sorcerer Apollonius of Thyane, at the command of Nebuchadnezzar, in order to guard the town from excessive cold and snow—all dug out near Hamadan—are all that now remains of that once most royal of cities.—There was another Ecbatana in Persis, which was given to the Magi; and a third in Syria, at the foot of Carmel, the present Kaïffa, where Cambyses, the son of Cyrus, suddenly died, 520 B. C.

**ECCE HOMO** (Lat. 'Behold the man'), the name usually given by artists to paintings representing Christ bound and crowned with thorns previous to his being led forth to crucifixion. On this exalted subject the highest efforts of art have been employed. The finest 'Ecce Homo' is that of Correggio, in the National Gallery, London; the whole conception of this remarkable picture being of the first order of genius. Other conceptions have been painted, such as that of Guido, a copy of which is given in the annexed illustration. See Dr Waagen's *Art and Artists in England*.



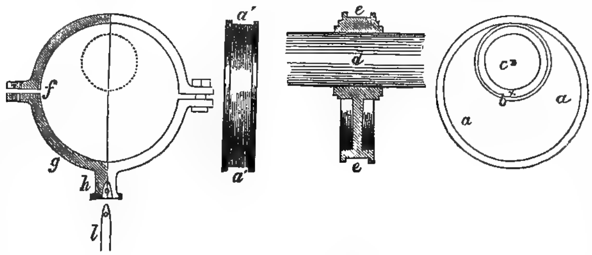
Ecce Homo.

**ECCENTRIC, or ECCENTRIC CIRCLE** (in the Ptolemaic Astronomy). It was a fundamental doctrine with the ancient astronomers, that every heavenly body moved in a circle (the perfect figure), and at a uniform rate. To move otherwise than uniformly and in the perfect figure, would have been unbecoming a heavenly body! But some of them appeared to misbehave by moving unsteadily, and in other figures than circles. Of course this was a mere deceptive appearance; but then, to save the fundamental doctrine, it must be explained. To explain it, they invented the *eccentric* circle. Suppose a body, such as the sun, to move in a circle ADB at a uniform rate, and a spectator to observe it, not from C, the centre of the circle, but from E. Then, if the sun's movement in a given time be from D to F, and in an equal interval thereafter be from F to G, a spectator at C would observe these movements as being circular and made in equal times, because at C, DF and FG, being equal, subtend equal angles. But if the spectator, instead of being at C, be at E, then, as the angles DEF, FEG are unequal, the sun's motion will not appear to be uniform, nor will his path appear quite circular. If, then, the earth, instead of being at the centre of the sun's orbit, be in a position away from it, the want of regularity in his movements will be explained. He will appear to describe unequal spaces in equal times. Accordingly, to reconcile the observed fact with the fundamental doctrine, the ancients placed the earth at E, a point away from the centre of the sun's supposed orbit. Hence this orbit was called the *Eccentric*, in respect that its centre did not coincide with that of the earth, which was considered as the centre of the universe.



Eccentric Circle.

**ECCENTRIC**, in Machinery, is a contrivance for taking an alternating rectilinear motion from a revolving shaft. It consists of a circular disc or pulley, fixed on a shaft or axis which does *not* pass through the centre of the disc. The right-hand figure of the cut represents a side-plan of an eccentric; *aa* the disc, the centre of which is at *b*; the inner circle is the shaft, with its centre at *c*; *ee* is a section along the axis of the shaft *d*; and *a'a'* an edge-view. A hoop, *gf*, embraces the groove *a'a'*, allowing the disc to turn within it. As the eccentric revolves with the axis, the hoop is alternately raised and lowered, and with it the rod *l*, which is keyed into it at *h*. The extent of the rise and fall of the rod is equal to twice *cb*, the distance between the centres. The eccentric is chiefly used where a subsidiary motion of small power is required; as for working the force-pump that supplies the boiler of a steam-engine (q. v.).



**ECCENTRI'CITY.** See fig. to art. ECCENTRIC CIRCLE. In such a figure as the eccentric circle, the eccentricity is the ratio of EC to the radius. In the ellipse and Hyperbola (q. v.), the eccentricity is the ratio of half the distance between the foci to the semi-major axis. In older mathematical works, eccentricity is sometimes used as the name of half the distance between the foci of an ellipse or hyperbola.

**ECCHYMO'SIS** (Gr. from *ek*, out of, and *chymos*, juice), a discoloration of the surface, produced by blood effused below, or in the texture of, the skin. It is usually attended by swelling to a greater or less extent, and is the result of injury. The presence of ecchymosis is sometimes adduced in courts of law as a proof of violent injuries having been inflicted during life, or very shortly after death. A question with respect to this was raised in the celebrated case of Burke and Hare, the West Port murderers in Edinburgh. Ecchymosis may sometimes be diminished by applying cold cloths or a bladder of ice to the surface, in the case of injuries quite recently inflicted.

**E'CCLESFIELD**, a township in the West Riding of Yorkshire, five miles north of Sheffield. Pop. (1861) 12,479. The chief manufacture is cutlery, but flax, linen, and nails are also branches of industry. There are coal and iron mines in the vicinity.

**ECCLESIA'STES** (Eng. the Preacher), the title (taken from the Septuagint) of a canonical book of the Old Testament; its Hebrew name is *Koheleth*, which signifies nearly the same. The inscription with which it commences is: 'The words of Koheleth, the son of David, king in Jerusalem.' Its authorship is commonly ascribed to Solomon. In support of this opinion, however, there is not a vestige of internal evidence except what arises from the dramatic use of his name, an expedient in all probability resorted to by the writer to give force and emphasis to his own reflections, inasmuch as Solomon was held by the Jews to be the perfection of human wisdom. The first who doubted the Solomonian authorship of the book was Grotius. Later critics have advanced further than Grotius. The actual writer probably flourished, according to Dr Davidson, in the later period of the Persian government, not long after the time of Malachi, i. e., 350—340 B. C. Such is also substantially the opinion of Rosenmüller, Knobel, Ewald, and De Wette. Hengstenberg, unquestionably the ablest critic of the orthodox German school, considers that the contents of the book may best be explained by supposing the author to have lived in a period like that of Malachi, in which there prevailed a pharisaical self-righteousness, and melancholy murmurings against the providence of God. The dates assigned to it by Hartmann (viz., the period of the Maccabees) and by Hitzig (204 B. C.) cannot well be sustained, as there is no trace in the book either of Grecian philosophy or language.

The chief arguments against the Solomonian authorship are *three*. 1. The writer indicates unconsciously his own posteriority in point of time by making Solomon say: 'I *was* king over Israel in Jerusalem' (chap. i. verse 12); a thing which Solomon could *not* have said during his life, for he was king to the end of it. 2. The condition of the country in the time of the writer, the oppression, judicial injustice, the elevation of fools and slaves to high offices, &c., do not fit the reign of Solomon at all, nor any preceding period. 3. The language is post-exilian. Ewald, the greatest Orientalist living, asserts that 'the Hebrew is so strongly penetrated with Aramæan, that not only single often-recurring words are entirely Aramæan, but the foreign influence is infused into the finest veins of the language.'—(Dr Davidson in vol. ii. of Horne's *Introduction to the Holy Scripture.*)

It is extremely difficult to ascertain the standpoint of the author. He is deeply convinced that 'all is vanity and vexation of spirit,' but whether this conviction springs wholly from a religious view of life, or is in part caused by personal disappointments, we have not sufficient internal evidence to determine. There is much in E. that, if it stood by itself, might be thought to be a mere product of cynical epicureanism, but it is mixed up with so much that is nobler, with a faith in God that rises high above the crushing considerations of the vanity of all mortal life, and the book terminates so grandly, that it seems more reasonable to believe that the aim or intention of the writer was moral and religious, and not cynical; that he painted the folly, weakness, and helplessness of men in such strong colours, only that he might destroy their self-righteousness, and cure them of that inability to read the laws of God, which self-righteousness always produces. For what is the conclusion of the whole matter? 'Fear God, and keep his commandments: for this is the whole duty of man.'

**ECCLESIASTICAL COMMISSIONERS FOR ENGLAND,** 'are a corporation with perpetual succession and a common seal, and with power to take, purchase, and hold real estate, notwithstanding the statutes of mortmain.'—Burns's *Eccles. Law by Phillimore.* The Ecclesiastical Commissioners consist of all the Bishops of England and Wales, the Deans of Canterbury, St Paul's, and Westminster, the two Chief Justices, the Master of the Rolls, the Chief Baron, and the judges of the Prerogative and Admiralty Courts; and also nine lay members, seven to be appointed by the Crown and two by the Archbishop of Canterbury. The lay commissioners, including all the judges, to be members of the United Church of England and Ireland. 6 and 7 Wil. IV. c. 77, and 3 and 4 Vic. c. 113. In addition to these commissioners, the Queen is empowered, by 13 and 14 Vic. c. 94, to appoint two, and the Archbishop of Canterbury one (lay members of the Church of England), by the title of Church Estates Commissioners. The Ecclesiastical Commission thus constituted is the result of certain reports made by commissioners previously appointed by the Crown. The object of the existing Commission is best explained by a reference to the instructions given to the original commissioners. 'To consider the state of the several dioceses of England and Wales, with reference to the amount of their revenues and the more equal distribution of episcopal duties, and the prevention of the necessity of attaching by commendam to bishoprics benefices with cure of souls; to consider also the state of the several cathedral and collegiate churches in England and Wales, with a view to the suggestion of such measures as may render them more conducive to the efficiency of the Established Church; and to devise the best mode of providing for the cure of souls, with special reference to the residence of the clergy on their respective benefices.' The Ecclesiastical Commission was permanently established in the year 1835. In order that it should be provided with a fund to enable it to carry out such schemes as should appear to it desirable, the seven best endowed sees were laid under a contribution amounting in all to the annual sum of £22,800. In addition to the income thus provided, several canonries in the various cathedrals are abolished, and other ecclesiastical preferments are extinguished, and the emoluments of the whole are vested in the commissioners. The Ecclesiastical Commissioners are required to lay before her Majesty in council such schemes as appear to them best adapted for carrying out the purposes of the act. It is provided that no proceeding which requires the common seal of the corporation is to be finally concluded, nor is the seal to be affixed to any deed, unless two at least of the episcopal commissioners are present, and consenting. Notice of every scheme is to be given to any corporation, aggregate or sole, affected thereby; and the objections, if any, are to be laid before her Majesty in council, together with the scheme. The scheme, if it receive the royal assent, is to be gazetted, and thereupon acquires the power of an act of parliament. By 19 and 20 Vic. c. 55, the duties of the Church Building Commissioners have been transferred to the Ecclesiastical Commissioners. The latter body have now, therefore, in addition to their previous powers, authority to divide or to unite existing parishes, and to create new districts. Such are, very briefly, the powers of the Ecclesiastical Commissioners. The policy which led to the appointment of that Commission is not a subject for our consideration. But it is easy to see that the influence for good and evil of so powerful an institution, over the Church of England, is enormous; and it cannot be matter of surprise that its proceedings are watched with scrupulous jealousy. As a result of its deliberations during the twenty-five years of its existence, two new bishoprics have been created and endowed, and a considerable number of small livings have been augmented.

On the other hand, it must be observed that much indignation has been excited by the expenditure of very large sums on the purchase and improvement of episcopal residences. It is, no doubt, fitting that the episcopal office should be furnished with appliances suitable to the position and dignity of a bishop; but the peculiar character of the revenues of the Ecclesiastical Commissioners must be borne in mind in applying those revenues. The funds of which they are composed have been violently diverted from the original purpose of the donors. Public necessity only can justify such an act. The plea put forward is the inequality of the revenues of the clergy, and the insufficient amount of the incomes of many benefices. But it may fairly be questioned whether it is a proper application of those funds to promote the convenience and luxury of those who are already liberally endowed.

**ECCLESIASTICAL CORPORATION.** The holder of an ecclesiastical benefice is, by the law of England, regarded as a corporation. Ecclesiastical corporations are divided into aggregate and sole. The former consist of several persons, as the head and fellows of a college, the dean and chapter of a cathedral, and are kept up by a continual succession of members. An ecclesiastical corporation sole consists of a single person and his successors in the benefice, as a bishop, a rector, a parson, or a vicar. The object of the common law, in thus regarding the incumbent of the benefice as a corporation sole, is to preserve the temporalities which are vested in him, and which would otherwise descend to his right heirs. The right of a rector or other corporation sole to the church and glebe, though said to be a freehold, is in fact little more than a tenancy for life. He is entitled to the full enjoyment of the benefice during his life, but he cannot sell it, and he is even punishable for waste. He may work mines or pits which he finds in use, but he is not entitled to open fresh mines. His right to timber is confined to felling it for repairs, but he is not entitled to sell it. See CORPORATION.

**ECCLESIASTICAL COURTS** are courts specially devoted to the consideration of matters relating to the clergy and to religion. For the origin of these courts we must go back to the first days of Christianity, when the early Christians, acting upon the injunction of St Paul—'Dare any of you having a matter against another go to law before the unbelievers and not before the saints'—had established courts, apart from those provided by the heathen governors, for the settlement of their own disputes. These courts were presided over by the bishops, who took cognizance of all matters, temporal as well as spiritual, arising among the brethren. As Christianity advanced, and was acknowledged as the revelation of the Almighty, these bishops' courts acquired an independent position, and were suffered to exist concurrently with courts of civil jurisdiction (Code lib. i. tit. 4, *de episc. aud.*), and gradually special matters were assigned as the subjects of their peculiar jurisdiction—viz., questions of tithes, and matrimonial and testamentary causes.

All writers on the early constitution of England are agreed in the opinion that, in this kingdom, there existed no separate ecclesiastical courts before the Norman Conquest. Previous to that time, all matters, civil and spiritual, were in use to be heard before the county court, in which the bishop and the earl sat together. But by a charter of William I. a distinction was made for the first time between courts civil and ecclesiastical. By this charter, authority was given to the bishops to hear causes ecclesiastical according to the canon law. The bishops' courts having been thus established in England, they became a fruitful source of dispute between the crown and the see of Rome, the latter claiming supreme jurisdiction in appeal in all causes ecclesiastical. This claim was from time to time conceded by the weakness or necessity of individual sovereigns, to be as frequently retracted when the emergency was past; in particular, by 27 Ed. III. c. 1, and 16 Rich. II. c. 5, all persons were prohibited, under penalty of *Præmunire* (q. v.), from resorting to the court of Rome or elsewhere. At the Reformation, by 24 Hen. VIII. c. 12, on the recital that the king is, under God, the head of the church, and again, by 25 Hen. VIII. c. 21, the authority of the pope in matters ecclesiastical was finally excluded. In Bacon's Abridgment of the Law, there are enumerated ten ecclesiastical courts—viz., Convocation, the Court of Arches, the Prerogative Court, the Court of Audience, the Court of Faculties, the Court of Peculiars, the Consistory Court, the Archdeacon's Court, the Court of Delegates, and the Court of Commissioners of Review. (For a full account of these courts, reference is made to the several heads, and also to the article DOCTORS' COMMONS.) It is to be observed that convocation, though a purely ecclesiastical assembly, is, in its nature and its duties, distinct from the courts of which we are now treating.

The chief ecclesiastical courts which have at various times existed in Scotland are the General Assembly, the Commissary Court, and the Court of Teinds. The former is the tribunal for the consideration of questions of doctrine and discipline according to the Presbyterian usage, and has existed since the Reformation. See ASSEMBLY, GENERAL; COMMISSARY; TEIND COURT.

**ECCLESIASTICAL LAW.** See CANON LAW.

**ECCLESIASTICAL TITLES ASSUMPTION ACT** (14 and 15 Vict. c. 49). In 1850, a ferment of Protestant zeal was awakened in this country by an edict issued by the court of Rome dividing Great Britain into territorial bishoprics, under an Archbishop of Westminster. The brief was issued from St Peter's, 'under the ring of the Fisherman,' on the 30th September 1850, and was almost immediately followed by a Pastoral by the newly appointed archbishop (Cardinal Wiseman), 'given out of the Flaminian Gate' on 7th October 1850. At the commencement of the parliamentary session of 1851, the subject of 'papal aggression,' and of the measures to be adopted to counteract it, superseded all other topics of interest. By a return made to parliament, it was ascertained that no less than 3145 addresses had been presented to her Majesty 'on the recent measures taken by the pope for the establishment of a Roman Catholic hierarchy in England.' It was in these circumstances that Lord John Russell introduced the Ecclesiastical Titles Bill, in a speech in which he dwelt strongly on the favour which had recently been shewn to Roman Catholics, especially in Ireland. By the Act 10 Geo. IV. c. 7, it had been provided that the right and title of archbishops to their respective provinces, of bishops to their sees, and of deans to their deaneries, as well in England as in Ireland, having been settled and established by law, any person other than the person thereto entitled who should assume or use the name, style, or title of archbishop of any province, bishop of any bishopric, or dean of any deanery, in England or Ireland, should for every such offence forfeit £100. By the Roman Catholic party it was alleged that this enactment struck only at the titles to existing provinces and dioceses, and that though the pope could not create an Archbishop of Canterbury, nor could his nominee assume that title without violating the law, there was no prohibition against the creation of an Archbishop of Westminster. To meet this allegation, and remove the doubt which existed, the Ecclesiastical Titles Act was passed, its object being to prohibit the assumption of such titles 'in respect of any places within the United Kingdom.' It consequently provides that all briefs, rescripts, and letters apostolical shall be unlawful and void by which any such title is pretended to be conferred, 'whether such city, town, or place, or such territory or district be or be not the see or the province, or co-extensive with the province of any archbishop, or the see or diocese of any bishop, &c.' The penalty of £100 for every contravention of the act, is to be recovered in accordance with the provisions of the former act, or at the suit of any person in one of her Majesty's superior courts of law, with the consent of the Attorney-general in England, or of the Lord Advocate in Scotland. The third section saves the episcopal bishops in Scotland from the operation of the act, providing, however, that 'nothing herein contained shall be taken to give any right to any such bishop to assume or use any name, style, or title which he is not now by law entitled to assume or use.' The passing of the act, combined with subsequent occurrences in Italy, allayed the fears of the country on the subject of papal aggression; and though its provisions have not been very steadily complied with in Ireland, it is believed that no prosecution under it has taken place.

**ECCLESIASTICAL YEAR.** See YEAR; also DATE.

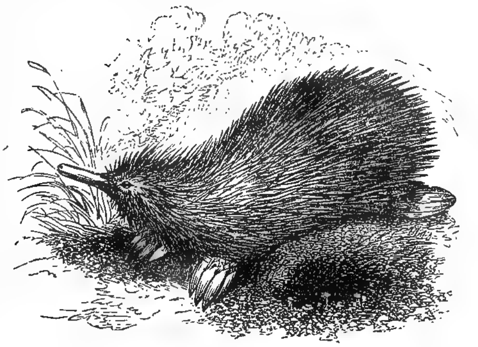
**ECCLESIA'STICUS**, the title of an apocryphal work, called in the Septuagint *The Wisdom of Jesus, the Son of Sirach.* It obtained the title of E., not because the writer was a priest (for regarding his profession nothing is known), but because it was, in the opinion of the fathers, the chief of those apocryphal works which they designated *ecclesiastici libri* (i. e., books not inspired, but which might be read in church for the edification of the people), to distinguish them from the canonical scriptures of the Old Testament. E. was originally composed in Aramaic; and the original text was apparently extant in the time of Jerome, who states that he had seen the Hebrew, but it is now lost. The author calls himself Jesus, the son of Sirach of Jerusalem; but when he flourished is not known. His book was translated into Greek, with an introduction by his grandson, who is usually, but not correctly, supposed to have had the same name as his grandfather. The date of the translation has been fixed as low as 130 B.C., and as high as 230 B.C. The former is the more probable. The contents of the work are not systematically arranged, so that we can only guess at what may be called the method and purpose of the thinking. The view taken of the mercy of God as extending to all mankind, indicates that the Jewish notions were breaking up; but still there is little to shew that any great spirituality was taking its place. Its tone resembles that of the book of Proverbs. Exhortations to cheerfulness are constant; medicine, agriculture, &c., are highly praised; life is regarded from an ethical rather than from a religious point of view, and consequently 'wisdom' is represented as the source of human happiness. The style of the writer is at times noble, and even sublime; and, to use the language of Addison, 'it would be regarded by our modern wits as one of the most shining tracts of morality that are extant, if it appeared under the name of Confucius or of any celebrated Grecian philosopher.'

**ECCLESIO'LOGY,** a word of recent use, is the name which has been given in the British Islands to the study of church architecture and decoration. Besides discriminating the various styles of ecclesiastical architecture, ecclesiology takes account of the ground-plan and dimensions of a church; of its orientation, or the deviation of its line from the true east; of its apse, or circular or polygonal east end; of its altar or communion table, whether fixed or movable, stone or wood; of its reredos, dossel, or altar-screen; of its piscina, or basin and drain for pouring away the water in which the chalice was rinsed, or the priest washed his hands; of the sedilia, or seats for the priest, deacon, and subdeacon, during the celebration of the eucharist; of the aumbrye, or locker, for the preservation of the communion vessels and elements; of the 'Easter sepulchre,' or recess for the reception of the host from Good Friday till Easter Day; of the altar-candlesticks; of the altar-steps; of the altar-rails; of the credence table, or shelf on which to place the communion elements before they were put upon the altar; of the 'misereres,' or elbowed stalls; of seats within and without the chancel walls; of the height of the chancel as compared with the nave; of the chancel arch; of the rood-screen, rood-staircase, rood-door, and rood-loft; of the piers or columns; of the triforium or blindstory; of the clerestory; of the windows; of the parvise-turret, or outside turret leading to the parvise; of the roof or groining; of the eagle-desks and letterns; of the pulpit; of the hour-glass stand, by which the preacher was warned not to weary the patience of the flock; of the reading pew; of the benches, pews, and galleries; of the aisles; of the shrine, fertour, or reliquary; of the benatura, or holy-water stoup; of the corbels, with special reference to the head-dress figured on them; of the pavement; of the belfry; of the baptismal font, with its accessories, the baptistery, the steps, the kneeling-stone, the chrismatory, the cover, and the desk; of the tower, with its lantern, parapet, pinnacles, louvres, windows, buttresses, and bells; of the porch and doors, with their niches and seats; of the parvise, or priest's chamber above the porch; of the mouldings; of the pinnacle crosses; of the gurgoyles, or rain-spouts; of the churchyard or village cross; of the churchyard yew; of the lych-gate, or corpse-gate, where the corpse was met by the priest; of the crypt; of the confessional; of the hagioscope, or opening in the chancel arch through which the elevation of the host might be seen; of the lychnoscope, or low window in the side-wall of the chancel, the use of which is uncertain; of the chest for alms; of the table of the ten commandments; of the church-plate; of the faldstool, or litany stool; of the embroidered work; of the images of saints; of the church well; of the sepulchral monuments and brasses, with their inscriptions; of the chapels or sacristies; of the vestry; of the dedication crosses. Ecclesiology has a literature of its own, including a monthly journal, called *The Ecclesiologist.* There are societies for promoting its study, one of which, 'The Ecclesiological late Cambridge Camden Society,' has published *A Handbook of English Ecclesiology* (Lond. 1847).

**ÉCHELON** (from the French *échelle,* ladder) is such a formation or arrangement of troops that, if viewed from a height, they would present some analogy to the successive steps of a ladder or staircase. The several divisions of the force, although parallel, are no two on the same alignement. Each has its front clear of that in advance, so that, by marching directly forward, it can form line with it. There are two kinds of echelon, *direct* and *oblique. Direct* echelon is adapted for attack and retreat; while *oblique* echelon (oblique in reference to the original front of the line) is adapted for changing position, or for getting on the enemy's flank.

The word echelon is also used in reference to nautical manœuvres. A fleet is sometimes said to be arranged *en échelon;* at which time it is compared by Sir Howard Douglas to a body of infantry in a square having its diagonal parallel with the front. In other words, it presents a wedge-form towards the enemy. Under this arrangement, the bow-guns and broadsides of the several ships can mutually defend each other; the stronger parts of one ship defending the weaker parts of some other.

**ECHI'DNA,** a genus of quadrupeds peculiar to Australia, and belonging to the order *Monotremata.* Two species have been described, differing in the scantiness and abundance of the hair, but it seems not improbable that they are mere states of the same species, perhaps depending on the seasons or on age. The E. is about the size of a hedgehog, and, like that animal, is covered with spines; which, however, are much larger and stronger, and are placed among soft silky chestnut-coloured hair. Its head is small, the muzzle much elongated and slender, terminating in a small mouth, which is destitute of teeth, but furnished with several rows of small spines upon the palate, directed backwards. The tongue is extensile, and is used, like that of



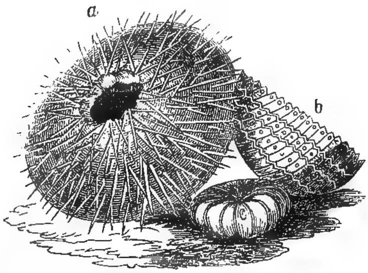
Echidna Hystrix.

ant-eaters, for catching ants, the ordinary food of the animal. The tail is very short. The legs are also very short, each foot furnished with five large broad claws, fit for digging and burrowing, the claws of the hind feet being concave, and directed backwards and outwards, so as to form very efficient shovels for throwing out the earth. The E. burrows with great rapidity, being possessed of strength perhaps greater in proportion to its size than that of any other quadruped. When it cannot more completely disappear under the earth, it inters itself so far as to present only its spiny back to an assailant. The E. is capable of very long abstinence, and confines itself to its burrow during droughts. In confinement, it may be fed on milk, hard-boiled eggs, &c.

ECHIMYD (*Echimys*), a genus of rodent quadrupeds, in some of their characters agreeing with dormice, but differing from them in having the tail scaly, and the fur coarse and mingled with flattened spines. They are all South American. Some of them are known as spiny rats. They display considerable beauty of colour. One species excavates long burrows in the ground.

ECHINEIS. See REMORA.

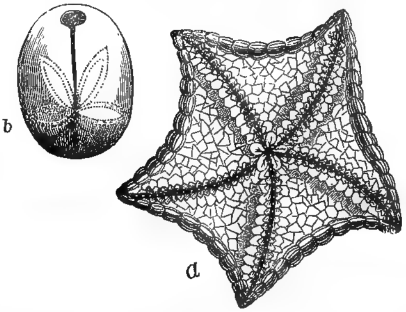
ECHINIDÆ, a family of *Echinodermata*, the species of which are popularly known as Sea-urchins, Sea-eggs, &c. They have the body covered with a calcareous crust or shell, of an extremely porous structure (and thus differing very widely from the shells of molluscs), in polygonal plates nicely adapted to each other, and increasing by additions to the edges of each plate, so that the shell may enlarge with the enlargement of the animal, whilst new plates are also added around the superior orifice. The shell is pierced with rows of holes for the Ambulacra (q. v.), and is externally covered in a living state with a membrane—sometimes very delicate, sometimes thick and spongy—which communicates by many delicate processes with the interior, and unites the bases of all the spines. The spines differ very much in the different genera and species, in their length, strength, number, and arrangement; they are attached to tubercles on the surface of the shell, by cup-like bases capable of working upon the tubercles, in the manner of a ball-and-socket joint; and they are moved by means of the connecting membrane so as to be employed in locomotion. In some species, they seem to be the principal organs of locomotion; in others, the ambulacra are so. By means of the spines, some, in which they are few and strong, can walk even on dry ground; others, in which they are minute and very numerous, employ them in burying themselves in the sand. The mouth of the E. is situated at the lower orifice of the shell, and is generally furnished with five flat calcareous teeth, moved by a very complex apparatus of bony sockets and muscles—'a very powerful mill' for grinding down their food, which is supposed to consist of small crustaceans and molluscs. The intestine is long and spiral; the vent, in the E. of most regular form, is at the upper end of the shell, exactly opposite the mouth; in others, in which there is a departure from the characteristic orbicular form, it is more or less lateral. The E. abound in all seas, and seem to have abounded still more in former geological periods. 'Of all the *Radiata*, they are most perfectly preserved in a fossil state,' and the knowledge of their habits and organisation is necessary to the geologist, 'in order to understand the relations and associations of the numerous species which abound in many of the earth's strata.'—Forbes.



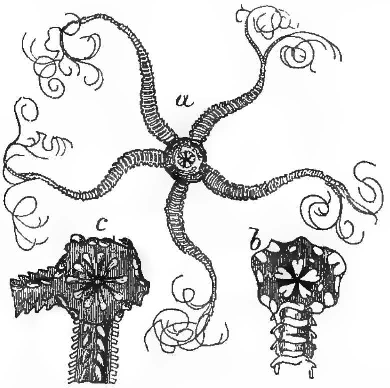
*a*, Echinus Esculentus; *b*, portion with spines removed; *c*, mouth.

ECHINOCO'CCUS. See TAPE-WORM.

ECHINODE'RMATA (Gr. spiny-skinned), a class of radiate animals, the highest in organisation of that great division of the animal kingdom. They have a digestive and a vascular system; for the former, however, there is in many of them only a single orifice; a circular and radiating nervous system has been observed in many; they are especially characterised by their well-organised skin, which in many is strengthened by calcareous plates, and in some also has the additional protection of numerous long spines. *Echinidæ* (Sea-urchins) exhibit these characteristics in greatest perfection. *Asteriadæ* (Star-fishes), *Ophiuridæ* (Brittle-stars), *Crinoideæ*, *Holothuriadæ* (Sea-slugs, Sea-cucumbers, &c.), and *Sipunculidæ*, are also ranked among the E., and have been variously arranged in orders by different naturalists. Spines are wanting in most



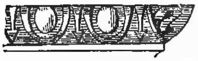
*a*, Asterias Tessellata (*Asteriadæ*); *b*, Spatangus (*Echinidæ*), or sea-egg.



*a*, Euryale Palmifera (*Ophiuridæ*), front view; *b*, disc and part of arm, front view; *c*, disc and part of arm, back view.

of them; in some (*Holothuridæ* and *Sipunculidæ*), there are not even calcareous plates, and there is no inconsiderable departure from the ordinary and perfect radiate form, an approach being made to the forms of molluscs and worms, whilst yet the accordance with the other E. is very perfect in other parts of the organisation. Almost all the E. are free, moving about at the bottom of the sea; some of them—at least in an immature state—are stalked and fixed. They are provided with 'an apparatus for water circulation,' a peculiar characteristic of radiate animals, and which 'can scarcely be said to exist in any of the other types.' By means of this it is that they fill and fit for use the suckers or *Ambulacra* (q. v.) with which most of them are provided, but of which the *Sipunculidæ* are destitute. The spines as well as the ambulacra of the E. are used by those which possess them (*Echinidæ* and *Ophiuridæ*) as organs of locomotion.—The British E. are described by Dr Edward Forbes in a most interesting work, entitled *A History of British Star-fishes and other Animals of the Class Echinodermata* (Lond. 1841).

**ECHI'NUS**, of Vitruvius, is a classical moulding in the form of a series of eggs, whence it is also called the ovolo or egg-moulding. The eggs are sometimes divided by an anchor or dart, as in the accompanying example. The type of this ornament is sometimes said to have been the chestnut and shell.



Echinus, or Egg and Anchor Moulding.

**E'CHIUM.** See VIPER'S BUGLOSS.

**E'CHO** (Gr. *sound*). Sound is produced by waves or pulses of the air; when such a wave comes against a wall or other opposing surface, it is reflected like light, and proceeds in another direction, and the sound so heard is an echo. Even the surface of a cloud suffices to reflect sound, as may be observed during thunder and the discharge of cannon. That the echo of a sound may return to the point where the sound originated, the reflecting surface must be at right angles to a line drawn to it from that point. Oblique walls send the echoes of a person's voice off in another direction, so that they may be heard by others, though not by him. In order to echo words distinctly, the reflecting surface must on the whole be even, or so curved as to resemble a concave mirror. This last form is necessary for returning a distinct sound when the distance is considerable. A great degree of evenness, however, is not essential, as it is no uncommon thing for the edge of a wood to return an echo. The distance of the reflecting surface must also be such as to allow a sufficient time to elapse between the sound and the return of the echo for the ear to distinguish them; when they succeed too closely, they merge into one. An interval of about $\frac{1}{9}$ of a second is necessary to discriminate two successive sounds; so that if we assume 1125 feet as the distance traversed by sound in a second, $\frac{1}{18}$ of 1125, or 62 feet, will be the least distance at which an echo can be heard, as the sound will go that distance and return in $\frac{1}{9}$ of a second. If the distance is less, the echo only clouds the original sound, but is not heard distinct. It is these indistinct echoes that interfere with hearing in churches and other large buildings (see ACOUSTICS); hence anything that breaks the evenness and continuity of the reflecting surfaces is an improvement in this respect. The number of syllables that any particular echo will repeat, depends upon how many can be uttered in the time that the sound takes to go and return from the reflecting surface. The echo at the tomb of Metella, in the Campagna, near Rome, of which Gassendi speaks as repeating a hexameter line requiring 2½ seconds to utter it, must therefore come from a distance of about 1500 feet. Such echoes are rare, as the various conditions are seldom all fulfilled. When there happen to be several reflecting surfaces at different distances in the direction of the sound, with a sufficient interval between them, each gives a separate and distinct echo. A similar effect is produced when two surfaces are inclined to each other in such a way as to give repeated reflections of the sound from the one to the other like the mirrors of a kaleidoscope, thus multiplying echoes of echoes. To this multiple and repeating class belong the famous echoes of Killarney, and that produced between the wings of the castle of Simonetta, near Milan, which repeats the report of a pistol 60 times.

**ECHO**, in Music, is the repetition of a melodic phrase, frequently written for the organ, on account of the facility with which it can be produced by the stops.

**E'CIJA**, a city of Spain, Andalusia, in the province of Seville, and 45 miles east-north-east of the town of that name, is situated on the left bank of the Jenil, in lat. 37° 33′ N., long. 5° 8′ W. It is surrounded by gardens, and stands in the centre of a district fertile in corn and oil. E. is a well-built and prosperous town. On account of the heat of the climate, this town is called by the Spaniards the Oven of Andalusia. E. has many pleasant alamedas (public promenades), shaded by trees, and adorned with statues and fountains; the principal promenade is that which stretches along the banks of the river. Pop. 33,700. E. was called in ancient times *Astigis*, and was one of the chief cities of the Roman province of Hispania Bœtica; its origin is unknown. It is said to have been visited by the Apostle Paul, a gilt statue of whom may be seen in the city. E. was called *Colonia Augusta Firma* by the Romans, and abounds in Roman antiquities. It also presents several specimens of Moorish architecture in the shape of gates and massive towers.

**ECK**, JOHANN MAYR VON, the well-known adversary of Luther, was born in 1486 at Eck, a village in Swabia, where his father, Michael Mayr, was a peasant, and afterwards a bailiff. Endowed with considerable ability, young Eck commenced at an early period the study of the Church Fathers and the Scholastics, and acquired a great skill in theological disputation. In 1518, when his *Obelisci* appeared in opposition to Luther's *Theses*, he was Doctor of Theology, Canon of Eichstädt, and prochancellor of the university of Ingolstadt. The publication of his *Obelisci* involved him in a disputation with Karlstadt, which lasted from the 27th June to the 16th July 1519. The only effect of the disputation on the people was to make them wonder at E.'s volubility; but having impugned some of Luther's views in the course of his disputation, he was assailed by the great Reformer, and by Melancthon. Eck nicknamed his opponents *Lutherans*, and instigated partly by personal hatred, and partly by Fugger (q. v.), went to Rome in 1520, to induce the pope to take strong measures against Luther. He returned with a papal bull of condemnation in his pocket, but the people in many places stood by Luther; and at Leipsic, in particular, Eck was so roughly received, that he had to take refuge in the monastery of St Paul's. Later we find him at the Augsburg Diet of 1530, where he let slip out the memorable statement, that 'with the Church Fathers, he would venture to oppose the Augsburg Confession, but not with the Scriptures.' In the religious convocations held at Worms in 1540, and at Ratisbon in 1541, he also took part. He died in

1543. A desire to shine and to play an important part in the affairs of men, coupled with a strong love of lucre, were the leading features of his character. Though an extremely learned ecclesiastic, he had no great talent, but was loud, boisterous, and full of assurance.

**E'CKERMANN**, JOHANN PETER, well known to the literary world through his intercourse with Goethe, was born in 1792, at Winsen on the Luhe, in Hanover, studied, 1821—1823, at Göttingen, and afterwards went to Weimar, where he took part in the *rêdaction* of the last volume of Goethe's *Sämmtlichen Werken.* At the same time, he commenced to contribute articles to the *Morgenblatt*, on Art and Antiquity. In 1827, the university of Jena conferred on him the degree of Ph. D. Two years later, he was appointed to superintend the studies of the heir to the grand duchy of Weimar, in the German and English languages and literature. In 1830, he travelled with Goethe's son in Italy, and on the death of the patriarch of German literature, he edited his posthumous writings. During the years 1839—1840, he edited a new edition of Goethe's *Sämmtlichen Werke*, in 40 vols. But E. is most widely and favourably known by his *Gespräche mit Goethe* (Conversations with Goethe). The greater part of these *Gespräche* appeared at Leipsic in 1836, the remainder at Magdeburg in 1848. It cannot be said with truth that E. has done for Goethe what Boswell did for Johnson, because Goethe did not require this. Johnson's writings give us but a faint idea of the man; hence Boswell's *Life* looks like a revelation; whereas there was the most perfect harmony in Goethe between the man and the author. Still, E.'s book is of immense value, just because it shews us this harmony, giving us, as it does, a picture of Goethe in his manifold social and literary relations, and exhibiting to us the simple, natural, and noble principles on which he studied and wrote. The *Gespräche* have been translated into all European languages, even into Turkish. The best English translation is that by John Oxenford (Lond. 1850). E. died at Weimar, 3d December 1854.

**ECKHU'NG CHOO**, a river of Tibet, is supposed to be the head stream of the Indus. It rises on the north side of the Himalaya, near the sources of the Sutlej. The actual locality of its sources has been assigned to the Kailas Mountains, in lat. 31° 25′ N., and long. 81° 40′ E. Flowing to the north-west, E. C. reaches long. 79° E. before it assumes the name of Indus.

**E'CKMÜHL**, a village on the Laber, in Bavaria, notable for the battle fought there, on the 22d April 1809, between 75,000 French and 40,000 Austrians. The Archduke Charles had taken up his position on the right bank of the Danube, near Eckmühl. From this point, at the head of four divisions of the Austrian army, he threatened Napoleon, and hoped to gain possession of the road to Donauwerth, the occupation of which would have decided the fate of Bavaria. This was prevented by Davout, who, moreover, by repeated attacks, contrived to keep the archduke in ignorance of Napoleon's designs. The plan of the latter was to cut off the Austrians from their whole remaining communications with the Iser and Inn, and by throwing them back upon Ratisbon and Bohemia, as their only line of retreat, to sever them entirely from the support and protection of Vienna. On the 22d, Napoleon suddenly appeared, with his army, opposite the village of Eckmühl. The action, on the side of the French, was commenced by Lannes, who drove back the Austrian left, while, at the same time, the village of E. was stormed by the Würtembergers. Shortly after, the high grounds between E. and Laichling, also occupied by the Austrians, were abandoned after a heroic struggle, and the archduke ordered a retreat on Ratisbon, which was admirably executed, though the defeated army was harassed by sixteen cavalry regiments. During the retreat, a magnificent and thrilling encounter took place at Eglofsheim between the French and Austrian cuirassiers, which, though it ended fatally for the latter, was largely instrumental in securing the retreat of the main body of the Austrian army. The Austrians had 5000 men killed and wounded, and 7000 taken prisoners, besides losing 12 standards and 16 pieces of cannon. The French loss was considerably less.

**ECLA'MPSIA** (Gr. *ek*, and *lambanō*—future, *lampsō*—I seize hold of), a somewhat pedantic and unnecessary technical term for Convulsion (q. v.).

**ECLE'CTICS, ECLE'CTICISM.** Eclectics was the name given in ancient times to those philosophers who had no determinate system of their own, but who professed to choose (*eklegein*) from all systems the parts that they considered true. The systems from which the selections were originally made were those of Pythagoras, Plato, and Aristotle, but ultimately eclecticism lapsed into an attempt to reconcile Platonism and Christianity. The chief representatives of this school were Plotinus and Proclus, who, however, did not so much make up a compound of doctrines gathered from without, as set up a view that endeavoured to unite the results of previous systems into a consistent whole. Many of the early Fathers of the Christian Church who had been educated in the pagan schools of philosophy and rhetoric, and retained a fondness for their early studies, were eclectics, such as Clemens Alexandrinus and Synesius of Cyrene. Modern eclecticism is conceived by some to have originated with Bacon and Descartes, but Hegel may be more properly considered its founder. In his *Philosophy of History* and other works, he endeavours, among other things, to point out the true and false tendencies of philosophic speculation in the various ages of the world; but it is to the lucid and brilliant eloquence of Victor Cousin (q. v.) that modern eclecticism owes its popularity. This system, if it can be so called, may best be defined as an effort to expound, in a critical and sympathetic spirit, the previous systems of philosophy. Its aim is to apprehend the speculative thinking of past ages in its historical development, and it is the opinion of some that such a method is the only one possible in our day in the region of metaphysics.

**ECLIPSA'REON**, the name given by Ferguson, the astronomer, to a contrivance which he invented for exhibiting the time, quantity, duration, and progress of solar eclipses.

**ECLI'PSES.** An eclipse is an obscuration of one of the heavenly bodies by the interposition of another, either between it and the spectator, or between it and the sun. The causes of eclipses, as suggested in this definition, are so simple and familiar, that it is difficult for us to imagine how deeply eclipses affected men's minds before the dawn of astronomical science. To the ancients, they were without the order of nature—terrible presages of dire events; and at Rome, at one time, it was blasphemy, and punished by law, to talk publicly of their being due to natural causes. So strong a hold had this superstition on the popular mind, that even after it came to be generally believed that eclipses of the sun were caused by the moon coming betwixt us and that orb, eclipses of the moon were still referred to supernatural agency. When the moon was in eclipse, the people turned out and made a great noise with brazen instruments—the idea being, that by doing so they gave her ease in her affliction. According to some, Luna, when in eclipse, was in the pains of labour; according to others, she was suffering from the arts of wicked magicians. Similar notions have prevailed among all barbarian tribes. The Chinese, it is well known, imagine eclipses to be caused by great dragons trying to devour the sun and moon, and accordingly they beat drums and brass kettles to terrify the monsters into letting go their prey. Several stories are told of these popular superstitions being turned to good account by knowing persons; among which are those which represent Thales as bringing about peace between the Medes and Lydians; and Columbus, when in a great strait, procuring provisions from the natives of Jamaica through the prediction of eclipses.

Stars, planets, and the satellites of planets, may suffer eclipse. The principal eclipses, however, are those of the sun and moon, called the solar, and lunar eclipses. The transits of the lower planets over the face of the sun are partial solar eclipses; but solar eclipses, properly so called, are those caused by the interposition of the moon between the sun and earth. Regarding solar eclipses, it is observed that they happen always at the time of new moon, when the sun and moon are in conjunction, i. e., on the same side of the earth. In a partial eclipse, the sun's disc suddenly loses its circular form; it becomes indented on one side, the indentation slowly increasing for some time, and then diminishing until it disappears altogether. In a total eclipse, the indentation goes on increasing till the whole orb for a time disappears; after a short interval, the sun reappears again, passing through the same phases of obscuration in an inverse order. In an annular eclipse, the whole orb is obscured except a ring or annulus. Lunar eclipses, again, it is observed, happen always at full moon, or when the sun and moon are in opposition, or on opposite sides of the earth, and are caused by the moon passing through the earth's shadow. Such eclipses are sometimes partial, and sometimes total, but never annular, and in their general phases they resemble those of the sun.

In speaking of eclipses, we shall have occasion to use certain terms, which we shall now define. The *duration* of an eclipse is the time of its continuance, or the interval between immersion and emersion. *Immersion* or incidence of an eclipse is the moment when part of the luminary begins to be obscured; *emersion* or *expurgation* is the time when the luminary begins to reappear or emerge from the shadow. When the quantity of an eclipse is mentioned, the part of the luminary obscured is intended. To determine this part, it is usual to divide the diameter of the orb into twelve *digits;* and the eclipse is said to be of so many digits, according to the number of them contained in that part of the diameter which is obscured.

Having given this general explanation of the facts of observation on which the theory of eclipses turns, and of the language employed in speaking of them, we now proceed briefly to explain the theory itself, and how it is possible to predict the time of occurrence, and the duration and quantity of eclipses.

1. *Eclipses of the Moon.*—It has been said that these are caused by the moon passing through the earth's shadow. Before this explanation can be accepted, it must be shewn that that shadow extends as far as the moon. This is easily done. Supposing the earth to have no atmosphere, then the shadow is the cone marked in shade in fig. 1, whose apex is at O; and the question is, whether the distance OT from the apex to the earth's centre exceeds the moon's average distance from the earth. Drawing TB, SA, from the centres of the earth and sun respectively, perpendicular to the line OBA, touching both spheres, and the line TC parallel to the line OBA, we have from the similar triangles OTB, TSC, the proportion OT : TB : : TS : SC. Now, we know that TS, the (mean) distance of the sun, is equal to about 24,000 times TB; also, from the construction, AC =TB; and we know that SA = 112 times TB, whence it follows that SC = 111 times TB. The above proportion, then, gives OT = 216 times TB, since $\frac{24000}{111} = 216$ nearly. But the moon's average distance is only 60 times TB (the earth's radius). Hence it appears that the length of the earth's shadow is almost four times the average distance of the moon, and that the moon can enter it. Further, it is clear that, should it do so, it may be totally obscured; for it must enter at a point much nearer T than half the distance OT, which is 108 times TB; and everywhere within that distance it might be shewn the breadth of the shadow is much greater than the moon's disc. But one consideration now remains to be stated to complete the proof of the theory of lunar eclipses. It was mentioned that they only occur at full moon, and we know that to be the only time when the earth is between the sun and moon, and so *has a chance* of throwing her shadow upon it. Why they do not occur every full moon, will be explained in treating of the prediction of eclipses.

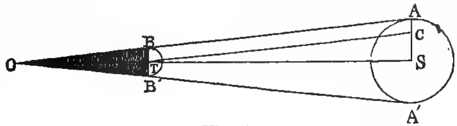


Fig. 1.

In the foregoing explanation, we proceeded on the assumption that the earth has no atmosphere. If the assumption were correct, the earth's shadow would be darker and narrower than it is, and the phenomena of eclipses shorter in duration, but more striking. The effect of the atmospheric refraction (see Refraction) is to bend the rays which are incident on the atmosphere in towards the axis of the cone of the earth's shadow, those which pass through the lowest strata of the air being most refracted, and converging to a point in the line OT (see fig. 1), at a distance equal 42 radii of the earth from the earth's centre. Accordingly, the moon, which, as we have seen, crosses the shadow at a distance of about 60 radii, never enters that part of it which is completely dark; thus, she never loses her light entirely, but appears of a distinct reddish colour resembling tarnished copper—an appearance caused by the atmospheric refraction, in the same way as the ruddy colour of the clouds at sunset. There is another reason why the phenomena of a lunar eclipse are less striking than, from the explanation given relative to fig. 1, might be expected. Every shadow cast by the sun's rays necessarily has a penumbra, or envelope, on both sides of the half-shadow. In the case before us (fig. 2), suppose a cone having its apex O′ between the sun and earth, and enveloping each of them respectively in its opposite halves, CO′C′ and AO′A′ (fig. 2). It is clear that from every point in the shaded part of the cone CO′C′, and without the shadow BOB′, a portion of the sun will be visible—and a portion only—the portion increasing as the point approaches either of the lines CB, C′B; and diminishing as it approaches the lines BO, B′O. In other words, the illumination from the sun's rays is only partial within the space referred to, and diminishes from its extreme boundary lines towards the lines BO, B′O. When, then, the moon

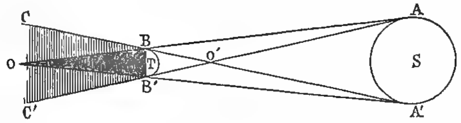


Fig. 2.

is about to suffer eclipse, it first loses brightness on entering this penumbra; so that when it enters the real shadow, the contrast is not between one part of it in shade and the other in full brilliancy, but between a part in shade and a part in partial shade. On its emersion, the same contrast is presented between the part in the umbra and the part in the penumbra. What we should expect on this geometric view of the earth's shadow, actually happens. From the breadth of the penumbra, it happens that the moon may fall wholly within it before immersion in the umbra commences; and so softly do the degrees of light shade into one another, that it is impossible to tell when any remarkable point on the moon's surface leaves the penumbra to pass into the umbra, or the reverse.

2. *Prediction of Lunar Eclipses.*—We said that lunar eclipses only happen at full moon. They do not happen every full moon, because the moon's orbit is inclined to the ecliptic, on which the centre of the earth's shadow moves at an angle of 5° 9′ nearly. Of course, if the moon moved on the ecliptic, there would be an eclipse every full moon; but from the magnitude of the angle of inclination of her orbit to the ecliptic, an eclipse can only occur on a full moon happening when the moon is at or near one of her nodes, or the points where her orbit intersects the ecliptic. An eclipse clearly can happen only when the centres of the circle of the earth's shadow and of the moon's disc approach within a distance less than the sum of their apparent semi-diameters; and this sum is very small; so that except when near the nodes, the moon, on whichever side of the ecliptic she may be, may pass above or below the shadow without entering it in the least. The moon's average diameter is known to be 31′ 25″·7, and from the *Nautical Almanac* we may ascertain its exact amount for any hour—its variations all taking place between the values 29′ 22″ and 33′ 28″. As for the diameter of the circle of the shadow, it is easily found by geometric construction and calculation, and is shewn to vary between 1° 15′ 32″ and 1° 31′ 36″; and its value for any time may be found from the *Nautical Almanac*, to which value astronomers usually add 1′ as a correction for its calculation proceeding on the assumption that the earth has no atmosphere. Starting from these elements, it is a simple problem in spherical trigonometry—which may be solved approximately by plane trigonometry by supposing the moon and the earth's shadow to move for a short time near the node in straight lines—to fix the limits within which the shadow and moon must concur to allow of an eclipse. Recollecting that the earth's shadow on the ecliptic is at the opposite end of the diameter from the sun, and that therefore as it nears one node the sun must approach the other—the sun and shadow being always equidistant from the opposite nodes—we find, from the solution of the above problem: 1. That if, at the time of full moon, the distance of the sun's centre from the nearest node be greater than 12° 3′, there cannot be an eclipse. 2. If at that time the distance of the sun's centre from the nearest node be less than 9° 31′, there will certainly be an eclipse. 3. If the distance of the sun's centre from a node be between these values, it is doubtful whether there will be an eclipse, and a detailed calculation must be resorted to, to ascertain whether there will be one or not. Into the nature of that calculation we shall not attempt here to enter; suffice it to say that, knowing from the *Nautical Almanac* the true time of the sun and moon being in opposition, the true distance of the moon from the node at the time of mean opposition, with the true place of the sun at that time, as well as the moon's latitude, we may, by means of these elements, combined with the obliquity of the moon's path and her motion relative to that of the sun, not only fix whether there shall be an eclipse or not, but predict its exact magnitude, duration, and phases. It may here be mentioned, that before the laws of the solar and lunar motions were discovered with anything like accuracy, the ancients were able to predict lunar eclipses with tolerable correctness by means of the lunar cycle (see Solar Cycle) of 18 Julian years and 11 days. Their power of doing so turned on this, that in 223 lunations the moon returns *almost* exactly to the same position in the heavens. If she did return to *exactly* the same position, then, by simply observing the eclipses which occurred during the 223 lunations, we should know the order in which they would recur in all time coming.

All lunar eclipses are universal or visible in all parts of the earth which have the moon above their horizon, and are everywhere of the same magnitude with the same beginning and end; and this universality of lunar eclipses is the reason why it is popularly thought, contrary to the fact, that they are of more frequent occurrence than solar eclipses. The eastern side of the moon, or left-hand side as we look towards her from the north, is that which first immerges and emerges again. The reason of this is, that the proper motion of the moon is swifter than that of the earth's shadow, so that she overtakes it with her east side foremost, passes through it, and leaves it behind to the west. It will be readily understood, from the explanations above given, that total eclipses and those of the longest duration happen in the very nodes of the ecliptic. But from the circumstance of the circle of the shadow being much greater than the moon's disc, total eclipses may happen within a small distance of the nodes, in which case, however, their duration is the less. The further the moon is from her node at the time, the more partial the eclipse is, till, in the limiting case, she just touches the shadow, and passes on unobscured.

3. *Eclipses of the Sun*, so called, are caused, as we have stated, by the interposition of the moon between the earth and sun, through which a greater or less portion of the sun is necessarily hid from view. In one sense, a solar eclipse might more properly be called an eclipse of the earth, caused by the moon's shadow falling upon it.

By a process similar to that used in ascertaining the length of the earth's shadow, it can be shewn that the greatest value of the length of the moon's shadow is 59·73 semi-diameters of the earth; at the same time, we know that the least distance of the moon from the earth is about 55·95 semi-diameters. It follows that when a conjunction of the sun and moon happens at a time when the length of the shadow and the distance of the moon from the earth are, or are nearly, equal to the values above stated, the moon's shadow extends to the earth and beyond it. Should the shadow in these circumstances fall upon the earth, there will be a total eclipse of the sun at all places within it or over which it moves (fig. 3). If L be the moon, T the earth, and *ab*L the moon's shadow cast by the sun, there will be a total eclipse of the sun at every point that is completely within the portion *ab* of the earth's surface. Again, the smallest value of the length of the moon's shadow may be shewn to be 57·76 semi-diameters of the earth, and the greatest distance of the moon from the earth is 63·82 semi-diameters. Suppose the moon interposed between the earth and sun when these values concur, it is clear that the moon's shadow will fall short of the earth. In this case, the sun cannot be altogether hid from any point of the earth's surface; but this case, or one approximate to it, is that in which there will occur an annular eclipse. In the figure, suppose O to be the apex of the shadow which falls short of the earth, and conceive the cone of the shadow produced earthwards beyond O into a second cone O*cd*; then from every point within the section *cd* of the earth's surface, the moon will be seen projected as a black disc on the middle of the disc of the sun, the portion unobscured forming a ring or annulus of light. While in the two cases just described the eclipse is total or annular at places within *ab* or *cd*, it will be partial at other places; the moon will appear projected against a portion of the sun's disc, making a circular indentation. To ascertain the places at which the eclipse will be partial, we have merely to form the cone of the penumbra of the moon's shadow in the manner explained in treating of lunar eclipses: at all places on the earth's surface within that cone there will be a partial eclipse. A simple calculation shews what is the observed fact, that the cone of the penumbra is not nearly large enough to embrace the whole of the face of the earth directed to the sun; in other words, solar eclipses are not universal, like those of the moon, i. e., they are not seen from all places that have the sun above their horizon at the time of the eclipse, which is the reason that though they are of more frequent occurrence than lunar eclipses, the latter are commonly supposed to occur more frequently.

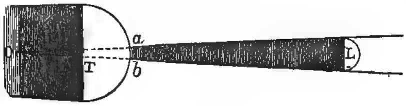


Fig. 3.

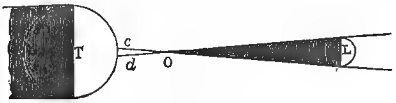


Fig. 4.

If one could take up a position in space from which he could command a view of the whole face of the earth turned to the sun during a lunar eclipse, the phenomena which he would observe would be somewhat as follows. Marking the point of the earth first touched by the penumbra of the moon's shadow, he would observe the obscuration spreading therefrom over a wide and wider area as the penumbra advanced, till at last, supposing him to be viewing the case of a total eclipse, there appeared the umbral cone marking the earth with a dark spot. By and by, the whole penumbral shadow would be on the earth. The black spot would then appear to travel onwards with the motion of the shadow, and in its centre, in a course determined by the composition of the proper motion of the shadow or moon, and the motion of rotation of the earth. Part of the globe would be free from the affection, and, in the course of time, the umbral spot would progress over different portions of the earth in succession, till at last it passed off the earth's surface, drawing after it the penumbral shadow. Could the spectator mark on the globe the various places affected by the shadow, with their degrees of shading, he would have a perfect chart of the course of the eclipse. The small belt of the globe traversed by the umbra would mark all places at which the eclipse would be total, while the degrees of shading over places adjoining that belt on both sides would indicate the magnitude of the partial eclipse as seen from them. The breadth of the belt traversed by the umbra, when the sun's distance is greatest and the moon's least, is estimated at about 180 miles; and in the same case the penumbra is estimated to cover a circular space of 4900 miles in diameter, the eclipse happening exactly at the node. If the eclipse does not happen at the node, it is clear that the axis of the shadow must be inclined to the plane of the ecliptic, that the shadow will be cut obliquely, and therefore that the part of the earth in shade will be oval. It may here be stated that astronomers usually calculate beforehand the motion of the shadow over the earth's surface, and prepare charts to exhibit its motion. Such a chart an observer from a position outside the earth would have it in his power to make from observation.

Of the commoner phenomena attending an eclipse of the sun, as regards the appearance of that luminary, nothing need be said; they are perfectly analogous to those of lunar eclipses, except in the case of the eclipse being annular. There are other appearances, however, attending an eclipse of the sun, especially when it is total, that are very remarkable. The almost instantaneous darkening of the orb of day, more particularly when it is unlooked for, is calculated to impress a spectator with vague terror; even when expected, it fills the mind with awe, as a demonstration of the forces and motions of the mechanism of the universe. The sudden darkness, too, is impressive from its *strangeness* as much as from occurring by day; it resembles neither the darkness of night nor the gloom of twilight. The cone of the moon's shadow, though it completely envelopes the spectator, does not, as we have explained, enclose the whole atmosphere above his horizon. The mass of unenclosed air accordingly catches the sunlight, and reflects it into the region of the total eclipse, making there a peculiar twilight. Stars and planets appear, and all animals are dismayed by the dismal aspect of nature.—See Mahoud-Bey's Report of the Total Eclipse of July 1860. Mr Warren De la Rue, who was one of an expedition of scientific men who went to Spain to witness the same eclipse, gives the following account of the aspects of nature near the time of totality: 'When the sun was reduced to a small crescent, the shadows of all objects were depicted with great sharpness and blackness, reminding one of the effects of illumination with the electric light. The sky at this period assumed an indigo tint, and the landscape was tinged with a bronze hue.'—*Athenæum*, 1860, vol. ii. page 259. At totality, there was still light enough to enable the observer to draw without the aid of his lamp, while the sky near the sun presented a deep indigo, and thence passed through a sepia tint to red and brilliant orange near the horizon. It must be said, however, that the strange appearance here recorded is exceptional, and probably not such as could ever occur in our latitude. There is one set of phenomena attending total eclipses of the sun, which are at once strange and invariable, and the causes of which cannot be said to be properly understood. As long as the total eclipse lasts, there appears round the sun and moon a luminous corona, as in fig. 5, while beyond the corona appear very brilliant prominences, frequently of a rose tint. These prominences were first observed during the total eclipse of 8th July 1842; but there seems to be no reason for doubting that they are constant attendants on eclipses. They were lately observed during the eclipse of 18th July 1860, when their appearance was such as to exclude the notion that they are due to irregularities in the moon's surface. Several authorities are disposed to refer them to the brighter portions or faculæ in the sun's surface (see Sun); and Mr De la Rue observes, that the sun's rotation in the course of the two days succeeding the eclipse brought to view faculæ, that at the time of eclipse would have just occupied the positions at which the prominences appeared.

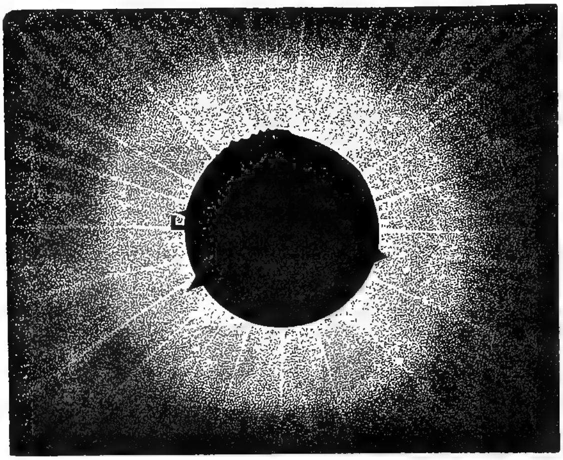


Fig. 5.—Appearance round the Sun during Total Eclipse.

In the eclipse of 1860, the light of the corona was a silvery white, and it extended beyond the moon's limb about eight-tenths of her diameter. The corona consisted first of a bright ring of about 2′ wide, and then an exterior and fainter ring of about 3′, beyond which, for a mean distance of about 2′, extended a glory of small rays—the whole corona extending to 7′ beyond the moon's limb. From the corona, at intervals, projected individual rays of remarkable size, and five in number: one of 9′ length; another of 14′, and shaped like the point of a star; a third, sabre-shaped, and extending 28′; a fourth, 28′; and a fifth, 10′. It may be mentioned that the notes taken by the members of the expedition to Spain have been all submitted to the astronomer-royal, with a view to his reporting on the eclipse. The report, which is looked forward to with interest, has not yet appeared.

4. *Prediction of Solar Eclipses.*—The period of 18 Julian years 11 days, referred to in treating of the prediction of lunar eclipses, applies equally to solar eclipses with lunar; but the ancients, who understood that fact, could find no law of recurrence of solar eclipses within that period, so as to predict them. The reason of the failure is obvious; for though solar eclipses recur in a fixed order within the cycle, they are not visible at the same places on their recurrence as when first observed. By modern methods, however, eclipses of the sun may be predicted, with all their circumstances of time and places of observation, with the most perfect certainty. We shall not, however, attempt to explain what these methods are; suffice it that they resemble those already generally described as applied in the case of lunar eclipses. At the time of a solar eclipse, the sun and moon are in conjunction; they are also in or near the same node; and no eclipse can happen if they are further than 17° from the node, or if the latitude of the moon, viewed from the earth, exceeds the sum of the apparent semi-diameters of the sun and moon. When within these limits, it is a problem of numbers and of spherical trigonometry to ascertain the nature of the eclipse, if any, which will happen.

*The number of eclipses* of the sun and moon together in a year cannot be less than two, or more than seven; the most usual number is four, and it is rare to have more than six. The explanation of the limitation of the number of eclipses is connected with the fact, that the sun passes by both nodes but once in a year, except in the case of his passing one early in the year, in which case, owing to the recession of the moon's nodes, he will again pass it a little before the end of the year. From the smallness of the cone of the moon's shadow, total solar eclipses are extremely unfrequent in any one place, compared with the frequency of their actual occurrence. At Paris, there was only one total eclipse of the sun in the 18th c., that of 1724, and there will not be another till near the close of the 19th century. In London, not one total eclipse was witnessed during the 575 years, 1140 to 1715.

**ECLIPSES OF THE SATELLITES.** See Satellites.

**ECLI'PTIC** is the name given to the great circle of the heavens round which the sun *seems* to travel, from west to east, in the course of a year. It took its name from the early observed fact, that *eclipses* happen only when both bodies are in or near this path. A little attention about sunset or sunrise shews that the sun is constantly altering his position among the stars visible near him, leaving them every day a little further to the west; and that this motion is not exactly east and west, or parallel to the equator, becomes also evident by observing that the sun's height at mid-day is constantly altering. It is further observed that, twice a year, about March 21 and September 23, the sun is exactly on the equator. The two points of the equator on which the sun then stands are the equinoctial points, and are the intersections of the equator and ecliptic. Again, there are two days in the year on which the sun reaches his greatest and his least mid-day elevation: the first is the 21st of June, the second the 21st of December. On these days, the sun has reached his greatest distance from the equator either way, and the points in his course where he thus seems to pause or halt in his retreat from the equator are called the solstices (*solis stationes*). These four points are distant from one another by a quadrant of the circle, or 90°. Each quadrant is divided into three arcs of 30°, and thus the whole ecliptic is divided into 12 arcs of that length, called Signs of the Zodiac (q. v.). These arcs or signs have been named after constellations through which the ecliptic passes. As the equinoctial points are not fixed, but recede yearly westwards about 50 seconds, and in a century about 1° 23′, the same constellations and signs that coincided when the division of the ecliptic took place, no longer coincide. The constellation of the Ram, for instance, which originally stood in the first arc or sign, now stands in the second, every constellation having advanced forward 30°, or a whole sign. Modern astronomers therefore pay little attention to these constellations and signs, but count longitudes from the existing spring equinoctial point from 0° to 360°.

Not only do the points change where the ecliptic and equator cross each other, but the angle of their inclination, called the obliquity of the ecliptic, is also variable. It is at present nearly 23½°, and is diminishing at the rate of about 50 seconds in a century. Were it to go on diminishing always, the ecliptic and the equator would at last coincide, and the earth would then have an everlasting spring. The decrease, however, has a limit; the obliquity oscillates between two definite bounds, which it can never pass. It has been calculated that it was at its greatest 2000 B.C., and was then nearly 23° 53′. Since then, it has been decreasing, and will continue to do so till about the year 6600 A.D., when it will be at its least, and about 22° 54′. These slight alterations cannot sensibly affect the seasons.

The physical cause of this change of the obliquity is the action of the other planets, especially Jupiter, Mars, and Venus, on the mass of the earth. The fact of the change was known to astronomers in very ancient times; Herodotus mentions an old tradition of the Egyptians, that the ecliptic had formerly been perpendicular to the equator—a notion into which they were most probably led by observing, for a long series of years, that its obliquity was constantly diminishing. There can be little doubt that the Chaldeans arrived at the epoch of 403,000 years before the entry of Alexander into Babylon, to which they proudly referred for their first astronomical observations, by computing the time when the ecliptic was perpendicular to the equator, on the supposition of its obliquity diminishing 1′ in 100 years. Though it was not till after the discovery of the law of gravitation that the change on the obliquity could be explained, yet that it was changing was believed in by many astronomers, although some doubted whether the differences in the values at different times were not due to errors of observation. The earliest known measure of the obliquity of the ecliptic was made by Tcheou Kong, the regent of China. Among the western nations, the earliest measurements were made by Pytheas and by Eratosthenes.

**ÉCOLE POLYTECHNIQUE** is one of the most celebrated military academies in France. In 1793, all the public establishments in Paris were in a convulsed state, owing to the Revolution. In 1794, M. Lamblardie, director of the *Ponts et Chaussées*, proposed the establishment of an *Ecole Centrale des Travaux Publics*, to educate young men for military, naval, and civil engineering. Monge and Carnot favouring his plan, it was carried out, and a school established at the Palais Bourbon. The first list of professors comprised names which afterwards acquired European celebrity—including those of Lagrange, Prony, Monge, Hachette, Hassenfratz, Fourcroy, Vauquelin, Berthollet, Chaptal, Pelletier, Guyton-Morveau, and Merimée. In 1795, the name was changed to E. P.; many alterations were made in the organisation; artillery studies were included in the course; and the pupils were ordered to wear a uniform. When Napoleon went to Egypt, 40 pupils from the E. P. accompanied him, many of whom greatly distinguished themselves. Napoleon made the organisation of the school more strictly military in 1804, to identify it more fully with the army. The school was dissolved in 1816, again in 1830, and again in 1832, on account of the impetuous way in which the pupils mixed themselves up with the political disturbances of those years; but as the school suited the military genius of the French nation, it was re-established on each occasion, after the restoration of tranquillity. Candidates can be admitted only by competitive examinations, which take place yearly. A proclamation from the War Office, made public before the 1st of April, informs intending competitors of the subjects on which they are to be examined, and the time when the examinations begin. To be eligible as a candidate, the youth must be French, and must be more than sixteen, and less than twenty years of age before the 1st of January following; but soldiers are admissible up to the age of twenty-five, provided they can give proof of two years of service in the regular army. The cost of board alone is 1000 francs (nearly £42) a year. A complete course of instruction lasts for two years; when the pupils who have satisfactorily passed the final examinations have the privilege of choosing, from among the various public services supplied from this school, the particular branch they wish to enter, such as artillery, engineers, the staff, the department of telegraphs, or some of the other government monopolies. The school was re-organised by a decree of the 1st November 1852. Its present title is Ecole Impériale Polytechnique.

**ECO'NOMY**, a Socialist village of Pennsylvania, in the United States, stands on the right bank of the Ohio, about 17 miles below Pittsburg. The settlement was planted in 1825 by immigrants from Germany. The inhabitants own everything in common—3500 acres of land, upwards of 100 houses, with a church, a school, a museum, and manufactories of wool, cotton, and silk.

**ECONOMY**, POLITICAL. See POLITICAL ECONOMY.

**ÉCORCHÉ**, a figure in which the muscles are represented, stripped of the skin, for purposes of artistic study, is called by the French an écorché, and from them we have borrowed the term. From a portion of the figure, the upper muscles are also removed, so as to exhibit those which lie nearer to the bone. It is not uncommon to represent the écorché in action, in the form of the Fighting Gladiator. The first person who did so was Salvage, a French artist and anatomist. In order to render the studies of pupils more complete, Salvage has had this figure engraved in all the points of view, and more or less denuded of flesh, till at last it is little more than a skeleton, the only muscles represented being those which immediately cover the bones. Figures of this kind can now be procured both in plaster and papier-mâché.

**ÉCOUTES** (Fr. *écouter*, to listen), in military operations connected with siege-works, are listening-places. They are small galleries, excavated at regular distances, and going out beneath and beyond the glacis, towards the lines and batteries of the besiegers. Their purpose is, to enable the garrison to hear and estimate the works being carried on by the sappers and miners of the enemy.

**E'CSTASY** (Gr. *ekstăsis*, a transposition, a change of situation or condition; applied to the mind in the sense of a state in which it is altered or fundamentally changed in character by some absorbing emotion), a word applied to those states of mind, which, without amounting to Insanity (q. v.), in respect of the temporary character of the affection, are marked by mental alienation, and altered or diminished consciousness. A person in ecstasy may be violently moved, or completely passive; convulsed, or rigid, or flaccid in all the limbs; silent, or uttering unmeaning or excited language, or assuming the character of a prophet or inspired person; having, or not having intelligence of what is going on around him. The varieties are infinite, because this morbid state of the mind is nothing more in reality than the fixing of it in a particular attitude, as it were, in connection with an overmastering idea, emotion, or sensation, which causes all other external phenomena to be disregarded. Perhaps the most common form, or, at all events, that which is best known, is religious ecstasy, closely allied to monomania and religious delusion of every kind; often simulated, but also occurring as a real disease, as in the case of those 'struck' in revival meetings, and in the older histories of the conversions of Cambuslang, the *convulsionnaires* of St Médard, and the epidemics of religious excitement mentioned under Dancing Mania (q. v.) It is also common to speak of the ecstasy of terror, and the expression is correct in exaggerated cases, where fear completely paralyses both the consciousness and the power of motion and expression; so also there is an ecstasy of joy, of love, of hate, of meditation; and in some physical states as Catalepsy (q. v.), Hysteria (q. v.), Mesmerism (q. v.), a true ecstasy is one of the phenomena, inasmuch as the proper consciousness of the individual is temporarily abolished, or so much changed in character as to lead almost to the loss of the sense of personal identity. Some of the cases of presumed Double Consciousness (q. v.) are no doubt of this kind; and generally the same may be said of the state of the mind in many dreams and visions, and also in Somnambulism (q. v.). A striking picture of this form of ecstasy is the well-known sleep-walking scene in *Macbeth*, where the lady's mind is so completely preoccupied with the supposed bloodstain on her hands, that though her eyes are open, we are told that 'their sense is shut,' and the mind is also excluded from all the ordinary avenues of communication.

**ECTOZO'A** (Gr. *ektos*, without, and *zoos*, living), a term which has been introduced, as in contradistinction to *Entozoa*, to designate those parasitic animals which live upon the external parts of other animals, as lice, ticks, &c. Such also are many of the entomostracous crustaceans, parasitic upon fishes. It is a question of much importance, not yet satisfactorily answered, if any of these creatures are the causes of diseased states, in connection with which they are sometimes found in particular abundance, or if their presence in unusual numbers is to be ascribed to disease previously existing.

**ECTRO'PION** (Gr. *ek*, and *trepo*, I turn out), an everted condition of an eyelid, in consequence of which it does not cover the globe of the eye. It is capable of being remedied by a slight surgical operation.

**ECTRO'TIC** (from Gr. *ectroma*, abortion), a term applied to methods of treatment which aim at preventing the development of a disease.

**ECTYPO'GRAPHY**, a method of etching, in which the lines are raised on the plate, in place of being sunk into it. See ETCHING.

**ECTYPUM**, a cast in relief of an ornamental design, produced from a mould.

**ECUADO'R**, the Spanish term for *Equator*, is the name of that fragment of Colombia (q. v.) which lies on both sides of the equinoctial line. In lat. it extends from 1° 40′ N. to 5° 50′ S., while in W. long. it stretches from 69° to 81° 20′. It measures, therefore, from north to south fully 500 miles, and from east to west nearly 850, presenting an area of about 300,000 square miles. It is bounded by New Granada, Brazil, Peru, and the Pacific. Toward the east it is drained by the Amazon, which receives all the rivers that fall down the eastern slopes of the Andes, while the country west of the Andes is drained chiefly by the Mira, the Esmerelda, and the Guayaquil—the last-named stream being more available for navigation than any other on the same coast of South America. The country is traversed, nearly in the line of a meridian, by the two ranges of the Andes, which, alternating between union and separation, sometimes run into what are called knots, and sometimes enclose, at great elevations, plateaus or table-lands. Among these last, ranging from south to north, the most important are those of Cuença, Hambato, and Quito—their respective heights above the sea being, in feet, 8640, 8860, and 9543. Lofty as these plateaus or table-lands are, they are beset, nay almost shut out from the world, by pinnacles of occasionally more than equal altitude above their own level. Of these the most remarkable are Chimborazo and Cotopaxi (q. v.). In connection with these physical features, the country is subject to volcanoes and earthquakes—the latter frequently occurring, and the former numbering altogether no fewer than sixteen. The climate comprises every possible variety. Hyperborean cold marks the snow-capped mountains; a temperature at once moderate and uniform renders the upland plains so many paradises; while, on both sides of the dividing ridge, intense heat oppresses the lower valleys. The rainfall is different in different localities. In the basin of the Guayaquil, there is regularly a wet season; between it and Cape San Lorenzo, almost perpetual drought prevails; and, in the other direction, the upper tributaries of the Amazon are said to be fed by almost perpetual rains.

The population is about two-thirds of a million, pretty equally divided, it is believed, between Spaniards, Aborigines, and Mestizoes, with a very inconsiderable admixture of Africans. The chief cities are Quito, the capital, and Guayaquil, the emporium of foreign trade; and the towns of the second class are Riobamba, Puno, Cuença, and Loxa. The government appears to have been constituted on the model of the United States of North America, having a president and vice-president, with a senate and a house of representatives. The external commerce is slowly but steadily advancing. Between 1852 and 1858, the imports had increased from £303,180 to £506,456; and the exports from £304,385 to £474,324. During the same interval, the British vessels—both entrances and clearances taken together—had multiplied from 22 to 82; being, at the close, fully one-half more numerous than the vessels of all other nations beyond the limits of Spanish America. In 1858, the principal articles of import, in order of value, were cottons—more than a fourth of the whole—woollens, wines, spirits, groceries, soap and candles, hardware, flour, linens, &c. In that year, the chief heads of export, also in order of value, were cocoa—about 55 per cent. of the entire amount—the precious metals, timber, bark, hides, orchilla, tobacco, &c.

**ECUME'NICAL** (Gr. *oikoumenikos*), i. e., universal, a term applied to ecclesiastical councils, regarded as representing the whole Christian Church, or the church of the whole world (*oikoumenē*), and to the orthodox or Catholic Church, regarded as opposed to heretical and merely local sects. The Roman Catholics claim the designation as appropriate to their own church. It is a title of patriarchs, archbishops, and ecclesiastical superintendents of provinces.

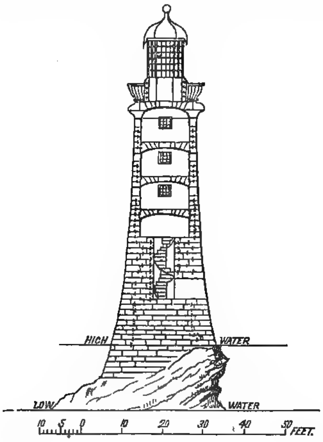
**EC'ZEMA** (from a Greek verb, 'to boil out'), an eruption of small vesicles on various parts of the skin, usually crowded together, with little or no inflammation around their bases, and unattended by fever.

**E'DDA.** There are two works which bear this title—the *Edda Sæmundar hins Froda*, or Edda of Sæmund the Wise, and *Snorri Sturleson's Edda.* The former and older of these is a collection of the most ancient mythological and heroic Scandinavian songs, the date of whose composition may probably be referred to different periods between the 6th and 8th centuries. These songs, which are supposed to have been collected and arranged by Sæmund Sigfusson, surnamed Frodi, an Icelandic priest, who was born between 1054 and 1057, and died in 1133, were discovered and first brought before the notice of European scholars in 1643, by Brynjolf Svendson, Bishop of Skalholt, who applied to them the name of Edda, or 'grandmother.' This collection was published entire at Stockholm, 1818, in 8vo, by A. A. Afzelius, after the text of Professor Rask; and at Copenhagen, in 3 vols. 4to, 1787—1828, with a Latin translation, glossaries, &c. The third volume of this edition, which was completed by Professor Finn Magnusen, consists chiefly of a very learned and copious Lexicon Mythologicum by the editor. A complete edition of the text of this Edda was also published by Professor Munch at Christiania, 1847, and by Möbius in 1859; while a German version of both Eddas was made by Simrock in 1851. Ettmüller has made a German translation of all the poems connected with the Nibelungen cycle; while the brothers Grimm have translated a part of Sæmund's Edda under the title of *Dreizehn Lieder in der Ursprache mit einer doppelten Uebersetzung*, &c. The Snorra Edda is a prose composition, and treats of Scandinavian mythology and of the language and modes of composition of the ancient skalds. As the name implies, it is referred to Snorri Sturleson (q. v.), the learned author of the *Heimskringla*, who was born in Iceland in 1178, and died by assassination in 1241, on his return from Norway, where he had lived in the capacity of skald or court-poet. This Edda, which was first arranged in 1628 by the Icelandic bishop, Arngrim Johnson, was published by Resen in 1665, under the title *Edda Islandorum An. Chr.* MCCXV. *Conscripta per Snorronem Sturlæ, Islandice, Danice, Latine, ex Antiq. Codicibus*, &c. A complete edition of the prose E., and the most copious of all, was published at Stockholm by Professor Rask, in 8vo, 1818. The first volume of the edition from the Arne Magnusen text appeared in 1848, with a Latin translation and notes, and a German edition of both Eddas, with glossary, &c., was published in 1859 by Lüning.

**E'DDOES.** See Cocco.

**E'DDYSTONE,** a group of gneiss rocks, daily submerged by the tide, in the English Channel, 9 miles off the Cornish coast, and 14 miles south-south-west of Plymouth Breakwater. The rocks lie in lat. 50° 10′ 54″ N., and long. 4° 15′ 53″ E., and have 12 to 150 fathoms water around. The frequent shipwrecks on these rocks led to the erection of a light-house on them by Mr Winstanley, 1696—1700. It was a wooden polygon, 100 feet high, with a stone base; but a storm in 1703 completely washed it away, with the architect. Another light-house was built, 1706—1709, also of wood, with a stone base, and 92 feet high, by Mr Rudyerd, a silk-mercer. This erection was burned in 1755. The present building, known as the Eddystone Light-house, and noted for its strength and the engineering skill it displays, was constructed by Mr Smeaton in 1757—1759, on the model, it is said, of the trunk of the oak-tree. It stands on the sloping side of one of the rocks, and is built of blocks, generally one to two tons weight, of Portland oolite, encased in granite. The granite is dove-tailed into the solid rock. The whole forms a circular tower 85 feet high, and rising from the base with a gentle curve. The base is 26¾ feet diameter, and has 13 feet of solid masonry on it, and the tower contracts to 15 feet diameter at the top. The light is a fixed one, at the height of 72 feet above the water, and is seen at the distance of 13 miles. See LIGHT-HOUSES.

Elevation of Eddystone Light-house.



Section of Eddystone Light-house.

**EDELINCK,** GERARD, a celebrated engraver, born at Antwerp 1627, died in Paris in 1707. He was invited to Paris by Colbert in 1665, and patronised by Louis XIV. He engraved numerous portraits, and many of Le Brun's works. All his works are executed with the graver with admirable clearness and precision.

**E'DEN,** according to the Hebrew Scriptures, the first residence of man. The description given of it in the book of Genesis is brief, obscure, and, in appearance legendary. The allegorical theory will be noticed under FALL (q. v.). In general, however, scholars have preferred to understand the story literally, and to believe that the writer or writers of it meant it to be so understood; but they have not, therefore, been unanimous as to the historical reality, or even the geographical position of Eden. The difference in their modes of apprehending the contents of the Hebrew Scriptures has manifested itself in this as in other *vexatæ questiones* of biblical criticism. Josephus and several of the Fathers conceived that Eden was a term denoting the entire region between the Ganges and Nile; Calvin, Huet, Bochart, Wells, &c., have, with slight differences of detail, concluded in favour of

Kornah in Babylonia, not far from the Persian Gulf; Reland, Calmet, Hales, Faber, J. Pye Smith, in favour of Armenia, near the sources of the Tigris and Euphrates; Le Clerc, in favour of the region near Damascus; while the modern German school of biblical critics, convinced that the Hebrew account is traditional, and, in its present form, of very late composition, and impressed, besides, with the vast antiquity of the far East, have, almost without exception, turned their eyes in that direction, and sought the cradle of the human race in Bactria or Cashmere, or the region lying to the north of it, a part of which is to this day called Audyana, the 'Garden.' It may also be mentioned that the Mohammedans believe Eden to have been in one of the seven heavens—some say the moon—and that the expulsion from paradise consisted in Adam being cast down upon the earth after the Fall. It is useless seeking to identify the river-system of Eden with anything known at present. There is no river on the face of the globe of which the Euphrates and Tigris (Hiddekel) are separate 'heads' (whether this means 'sources' or 'channels'), as they are said to be in the 2d chapter of Genesis, for, as Major Rennell has shewn, although the Euphrates and Tigris *now* unite for a short space on their way to the Persian Gulf, yet, until the time of Alexander the Great, they kept entirely distinct courses; and therefore it has been assumed that the 'Deluge' completely altered the physical character of the region denoted by the term Eden. This was Luther's notion, to which, however, it has been objected, that the narrative in Genesis is so worded as to convey the idea that the countries and rivers spoken of were still existing in the time of the historian. Besides, the science of geology has thrown so much doubt on the universality of a Deluge so late as the period assigned to Noah, that it is hazardous to argue on the hypothesis of any extensive physical changes having taken place since the first appearance of man on the planet; at least, if that be dated only some six thousand years back. It will thus be seen that the question of the locality of Eden, or of the exact sense in which the Mosaic narrative is to be understood, is involved in inexplicable mystery; and it has become a general opinion, that the spiritual significance of this primeval story is what principally concerns Christians—an opinion which derives force from the total silence of the New Testament in reference to the subject.

**EDEN**, a river rising in the east of Westmoreland, in the Pennine Chain. It runs north-north-west through the east of Westmoreland and Cumberland, past Appleby and Carlisle, and ends in a fine estuary at the upper part of the Solway Firth, after a course of 65 miles.

**EDENTA'TA** (Lat. toothless), an order of *Mammalia* established by Cuvier, and generally received by naturalists. Cuvier remarks, that 'although brought together by a purely negative character,' the E. have, nevertheless, 'some positive mutual relations, particularly in the great claws which encompass the ends of their toes, and which more or less approximate to the nature of hoofs; also in a certain slowness or want of agility, obviously arising from the peculiar organisation of their limbs.' He included among them, however, the *Monotremata*, which, although so few in number, are now generally separated, on account of the very important differences of organisation which characterise them. The remaining E. are divided into two tribes—1. *Tardigrada* (slow-paced), containing only the Sloths; and, 2. *Effodentia* (diggers), containing Armadillos, Pangolins, Ant-eaters, &c. The ant-eaters and pangolins are the only E. that are absolutely destitute of teeth; but none of the order have any teeth in the forepart of their jaws, and their teeth are comparatively imperfect in structure, being destitute of enamel and distinct roots. The sloths alone subsist on vegetable food, the rest chiefly on insects or on animal substances in a decaying state. The whole number of existing species of E. is not great; but they appear to have been more numerous and of much greater size in a former geological period, as the remains of the *Mylodon*, *Megatherium*, and *Megalonyx* testify.

**EDE'SSA** (modern name, *Urfah*, or *Orfa*), a very ancient city, on the river Daisan, in the north of Mesopotamia, 78 miles south-west of Diarbekir, although the Christian or Mohammedan legend, ascribing its foundation to Nimrod, or Khabiba, a female contemporary of Abraham, is unworthy of any credence. With the conquest of Persia by the Greeks, the history of E. first becomes clearer. Seleucus, in particular, is said to have done much for the aggrandisement of the city. Christianity was introduced into E. at an early period. In the reign of Trajan, the place was made tributary to Rome, and in 216 A.D. became a Roman military colony, under the name of *Colonia Marcia Edessenorum*. During this period, its importance in the history of the Christian Church continued to increase. More than 300 monasteries are said to have been included within its walls; it was the seat of Ephraim Syrus and his school, and played an important part in the Arian and other controversies. With the extension of the religion of Islam, E. fell into the hands of the Arabian califs. Christianity declined, and wars at home and abroad during the califate, destroyed likewise its temporal splendour and prosperity, till, in 1040, it fell into the possession of the Seljuk Turks. The Byzantine emperors succeeded in recovering E., but the viceroy contrived to make himself independent. He was, however, hard pressed by the Turks, and this rendered it easy for the crusader Baldwin, the brother of Godfrey of Bouillon, to gain possession of the city (1097 A.D.), and make it the capital of a Latin principality, and the bulwark of the kingdom of Jerusalem. Under the Frankish princes, E. held out valiantly against the Mussulmans, till at length Zengi, ruler of Mosul, succeeded in taking the town and citadel in the year 1144, when all the Christian churches were converted into mosques. An attempt made by the inhabitants to throw off the Turkish yoke, completed the ruin of E.: the Edessenes were defeated by Nur-ed-din; and all who were not massacred, were sold as slaves. After many vicissitudes, in the course of which E. fell successively into the hands of the sultans of Egypt, the Byzantines, the Mongols, Turkomans, and Persians, the city was finally conquered by the Turks, and has ever since formed a portion of the Turkish dominions. It now contains 40,000 inhabitants, of whom 2000 are Armenian Christians; the rest are Turks, Arabians, Kurds, and Jews. At present, E. has numerous mosques and bazaars; manufactures of cotton goods, goldsmiths' wares, and morocco leather, commerce in British manufactures obtained by way of Aleppo, and a large trade in corn, &c., with Syria. E. is regarded by the Easterns as a sacred city, because they believe it to have been the residence of Abraham.

**E'DFOU** (Coptic, *Atbô;* Egypt. *Hut;* anc. *Apollinopolis Magna*), a town of Upper Egypt, is situated on the left bank of the Nile, in lat. 25° N., and long. 32° 45′ E. It contains the remains of two temples, which are considered the finest remains of antiquity in Egypt. The larger of these temples was commenced by Ptolemæus Philometor 181 B.C., but does not appear to have been completed till the reign of Claudius. There appears, however, to have been a temple there in the reign of Thothmes III. Its length is about 400 feet, its breadth 150. Its entrance is by a gateway 50 feet high, between two immense truncated pylones, 37 feet wide at the base, and 114 feet high. These are adorned with masterly sculptures. Passing through this entrance, the court is reached; it is 161 feet long, and 140 feet wide, enclosed by a splendid colonnade of 32 pillars, each differing in design, and surrounded by walls, between which and the pillars there is a stone roof, forming a covered portico. The interior of this court is to a great extent filled up with rubbish, and occupied by wretched dwellings, many of which also are built upon the roof of the temple. Within the temple, there are several chambers, one of which, about 33 feet by 17, contained the image of the deity; in it was also a zodiac. The effect of the whole is grand and imposing, impressing the mind with the harmony and perfect beauty of the design. An inscription on the outer wall recorded the endowment of the temple by Ptolemy Alexander I., and Darius, Nectanebo, and Nectanebes II. The smaller temple, erected by Physcon and Lathyrus, consists only of two chambers. Its walls are covered with hieroglyphics representing the life of *Horus*, the son of *Kneph and Athor*, who were worshipped in the great temple. These temples have been lately entirely cleared by Mariette. E. has at present a population of about 2000. Its manufactures are blue cotton cloths, and earthen-ware similar to the ancient Egyptian pottery.—Wilkinson, *Modern Egypt*, p. 274; Brugsch, *Reiseberichte*, p. 225; Lepsius, *Egypt and Ethiopia*, p. 117.

**E'DGECUMBE.**—1. A bay in the east coast of Australia, lies within the province of Queensland, near lat. 20° S., and long. 148° E. It is sheltered on every side but the north, its east barrier terminating in Cape Gloucester.—2. A mountain in Russian America, marks the north-west point at the mouth of Norfolk Sound, which connects the metropolitan settlement of New Archangel on the island of Sitka with the open ocean. It rises from the water's edge as an almost perfect cone, which, during nearly the whole year, is capped with snow. It has been an active volcano within the recollection of some of the Russian colonists; and, even at the present day, the neighbourhood presents indications of subterranean energy, such as tremblings of the earth, hot springs, and eruptions of smoke and ashes. See AMERICA.

**E'DGEHILL**, BATTLE OF. The first great battle of the Civil War was fought on Sunday, 23d October 1642, between the royalist forces under Charles and the parliamentarians under the Earl of Essex. It was the intention of Charles, who had been lying at Shrewsbury, to march upon London by Wolverhampton, Birmingham, and Kenilworth; and Essex, who had thrown himself into Worcester, on being informed of the king's plans, marched forward to intercept him, and entered the village of Keinton, in Warwickshire, on the evening of the 22d. On the following morning, the royalist army was discovered a little in advance, and drawn up in order of battle on the elevation of Edgehill. The king's forces had the advantage in numbers and in cavalry, as well as in position; Essex, however, had the more formidable train of artillery. Charles had commanded that hostilities should be delayed until the enemy should open fire; accordingly no movement took place till about two o'clock, when Essex commenced the fight by firing upon the royalists, who immediately replied with their cannon. The royalists then began to descend the hill, and Prince Rupert, who led the right wing, charged with his cavalry the left wing of the parliamentarians, broke it, and pursued it madly to Keinton, where his men, regardless of the main army, busied themselves in plunder. This was the fatal movement of the day. The right wing of the parliamentarians had charged and recharged with the greatest success, until, after some stubborn fighting around the royal standard, the royalists broke, and retreated toward the hill. That night 4000 men lay slain at the foot of Edgehill, and of these the greater number were royalists.

**E'DGEWORTH**, MARIA, the daughter of Richard Lovell Edgeworth of Edgeworthstown, county of Longford, Ireland, was born at Hare Hatch near Reading, Berkshire, in the year 1767. In 1782, her father returned to Ireland, accompanied by his family, to whose education he earnestly devoted himself. Maria's talents quickly developed themselves. Her first literary effort was written in conjunction with her father, and was entitled *Essays on Practical Education* (1798). In 1801 appeared the *Essay on Irish Bulls*, which was also in part the work of Mr Edgeworth. But it was in the sphere of fiction that Miss E. won her greatest triumphs. In 1801 she published *Castle Rackrent*, the first of a pretty extensive series of novels characterised in general by a quiet agreeable humour, excellent sense, and lively delineation of character and manners. It has been objected by critics, however, that some of them are too manifestly didactic to please as fiction should please. In 1803 appeared *Belinda*; in 1804, *Popular Tales*; in 1806, *Leonora*; in 1809, *Tales of Fashionable Life*; and in 1812, a second series of the same. The last of the series was 'Helen,' which was published in 1834. Among the most successful of her *Tales of Fashionable Life* were 'Ennui' and 'The Absentee.' Miss E.'s stories for children—the last of which, *Orlandino*, appeared in *Chambers's Library for Young People*—are deserving of high praise. This gifted and universally respected authoress died at Edgeworthstown, 21st May 1849.

**EDGINGS** are indispensable to neatness in gardening, except where parterres are cut out of a lawn, but more especially to separate gravel-walks from cultivated ground. They are sometimes made of stone, or of deal; sometimes of ornamental wicker-work, and now not unfrequently of wirework; but for many purposes, the best edgings are formed of low-growing evergreen plants, and none are so common in Britain as those of dwarf box, which, when carefully trimmed, are very pleasing to the eye, and do not require renewal for a number of years. Thrift or sea-pink is another not uncommon edging, is beautiful at all times, and particularly so when in flower, but requires frequent renewal. The double daisy, often planted as an edging, also requires frequent renewal. Turf-edgings are sometimes employed for wide flower-borders.

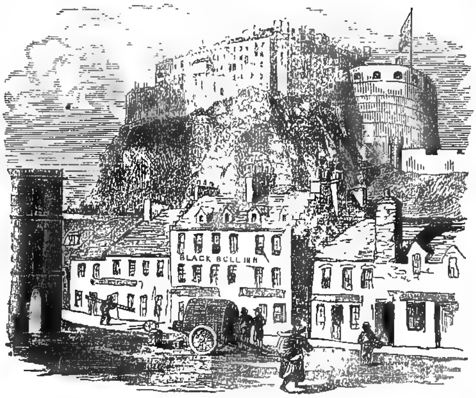
**E'DIBLE BIRDS' NESTS**, or **EDIBLE SWALLOWS' NESTS**. See NESTS, EDIBLE.

**E'DICT** (Lat. *edictum*). The power of making edicts (*jus edicendi*) belonged generally to the higher magistrates at Rome; but it was by the curule ædiles, and more extensively still by two prætors—the *prætor urbanus*, and the *prætor peregrinus*—that it was prominently exercised. In a province, the jurisdiction of the prætor passed to the *præses*. As this power was co-extensive with the possession of what were called the honours (*honores*), it was frequently spoken of as the *jus honorarium*; and from its being exercised chiefly by the prætors, it was also known as the *jus prætorium*. The edicts of the prætors are mentioned by Gaius among the sources of the Roman law; but, strictly speaking, they are to be considered as rules promulgated by the magistrates on entering on office, rather than as expressions of the will of the Roman people, either direct or indirect. The edict of one prætor was not binding on his successor, but very often edicts were adopted and confirmed, and this came gradually to constitute a very important body of law. They were frequently known by the names of their first promulgators, though they were often named with reference to the formula and the *actio* which they established. The power of promulgating edicts is supposed to have flowed down from the kings to the consuls, and through them to the prætors, and thus to have formed part of what we should call the royal prerogative. Even in Cicero's time, the study of the edict had become a regular branch of the study of the law. In 67 B.C., the Lex Cornelia provided against the abuse of passing edicts for the decision of particular cases by requiring the prætors to decide in conformity with the edicts which they promulgated with reference to their whole tenure of office, which were known as perpetual edicts. Servius Sulpicius, the friend of Cicero, addressed to Brutus a work on the subject; and Ofilius made what was probably a compilation of the various edicta, resembling the subsequent one by Julian. The object of the edict, according to the Roman jurists, was to aid, supplement, and correct the civil law, and to render it more conducive to the public service, and they speak of it as 'the living voice of the civil law.' It was, in short, an indirect form of legislation, which public opinion had sanctioned for the public convenience; and there can be no doubt that it contributed what was ultimately the most valuable part of the Roman law. There were many commentators on the edicts under the emperors, amongst whom Labeo is mentioned and cited by Ulpian (*Dig.* 4, tit. 3, s. 9). Julian is supposed to have collected and arranged the edicts, and given to them a systematic form. Gaius, Ulpian, and Paulus composed treatises on the edicts of the curule ædiles; and it is chiefly from the writings of these and the other jurists excerpted in the *Digest*, that we know anything of the character of the edict, the portions of it which have been preserved being mere fragments. They have been collected by Wieling in his *Fragmenta Edicti Perpetui* (Frank. 1733).

**EDICT OF NANTES.** See NANTES.

**EDICTAL CITATION,** or **INTIMATION.** By the former practice of Scotland, where the party to be cited before a civil court was out of Scotland, the citation required to be given by a messenger-at-arms making proclamation at the market-cross of Edinburgh, and at the pier and shore of Leith. The idea, of course, was, that the fact was thus more likely to reach the absent party than if it had been intimated or published in any other manner.—Erskine, b. i. tit. 2, s. 18. But the practice in this matter was altered by the so-called Judicature Act (6 Geo. IV. c. 120), and the subsequent statute, 13 and 14 Vict. c. 36, s. 22, which enacted that services against persons forth of Scotland should be done by delivery of copies at the record office of the keeper of the records of the Court of Session. Abstracts of the copies delivered to the keeper are ordered to be recorded by him, and to be printed periodically at the end of each successive fourteen days, and the record is to be at all times open for inspection. In criminal cases, the old forms still remain unaltered.

**EDINBURGH,** the capital of Scotland, and chief town in the county of Mid-Lothian, occupies a picturesque situation on a cluster of eminences, at the distance of a mile and a half south from the Firth of Forth (q. v.), which is here about six miles in breadth. The city has extended almost to the shore of the Firth, and has thus formed a connection with Leith, the ancient port; Newhaven, a fishing-village; and Granton, a modern and rising port for steamers. The country around E. is a happy blending of hill and plain. Closely adjoining, on the south-east, rise Arthur's Seat and Salisbury Crags; at the distance of four miles to the south-west is the range of the Pentland Hills; and within a mile on the north-west is the richly wooded Corstorphine Hill. The rest of the neighbourhood consists of fine fertile fields, well cultivated, and ornamented with gardens and villas.



Edinburgh Castle from the Grassmarket.

The name E. is of uncertain origin. In the Gaelic language, it is Dunedin. From the castle, which was undoubtedly the first built, a town gradually extended on the top and sides of the ridge, which slopes downwards towards the east. Originally, and for several centuries, the city was confined entirely to this ridge or hill; and for some ages it was flanked on the north by a dam or lake. The remaining means of defence was a wall, of which some few relics, of different eras, still exist. E. was, therefore, at one time a fortified town, reposing under the shelter of the castle at its western extremity.

In the 12th c., David I., a pious and munificent Scottish monarch, founded the Abbey of Holyrood, in the low ground eastward from the city; he at the same time empowered the canons of this religious house to found a burgh in a westerly direction up the slope towards E.; and thus was built the Canongate, a suburb now united to the city. In connection with Holyrood there also sprung up a royal palace, which became a favourite abode of the Scottish sovereigns. Not, however, until the era of the murder of James I. at Perth, in 1436—1437, did E. become the recognised capital of the kingdom. Neither Perth nor Scone, Stirling nor Dunfermline, being able to offer security to royalty against the designs of the nobility, E. and its castle were thenceforth selected as the only places of safety for the royal household, the parliament, the mint, and the various central government offices. Rising into importance as some other places sunk, E. became densely crowded with population; and, hampered by surrounding walls, within which it was thought necessary to keep for the sake of protection, its houses rose to a great height. In addition to the original main way called the High Street, and a parallel one of later origin on the south, styled the

Cowgate, there were upwards of a hundred cross alleys, called closes, containing a dense cluster of houses. For the most part each house consisted of a succession of spacious floors, styled *flats*, each of which was a separate dwelling. Of such floors there were seldom fewer than six, and sometimes as many as ten in one building.

The citizens remained content with these confined limits till about the middle of the 18th century. Between 1763 and 1769, the North Bridge was erected, connecting the old city with the fields on the north, on which the *New Town* was already beginning to be built. Before 1780, the New Town had covered a third of the ground designed for it; and since that period, it has been gradually extending northwards, westwards, and eastwards. Its last principal extension was the opening of a new road eastwards from Princes Street by Waterloo Place, along the face of the Calton Hill, in 1819. Between 1826 and 1840, some other alterations were effected. A vast number of old houses were pulled down; but, except the erection of a bridge across the Cowgate (George the Fourth's Bridge), and the formation of an approach from the west, little that is useful or ornamental has been accomplished. More lately, the introduction of railways, with the chief terminus in the hollow adjoining the North Bridge, has caused considerable changes in that quarter, including the opening of a handsome street (Lord Cockburn Street) to give access from the High Street to the railway station. The laying out of the hollow between the New and Old Town as public gardens, has added much to the general effect, and these form a fine feature in the town.

Altogether built of durable sandstone, the general aspect of the houses is that of great solidity. The architecture, if somewhat bare and monotonous, is usually chaste, and the masonry of the first order. It may almost be said, that, for the most part, the private excel the public edifices in beauty. The latter, however, are, on the whole, above mediocrity. With one or two exceptions, they are from the best classic models, and at least do not violate good taste. The Scott Monument alone, the work of a native self-taught artist, is unequalled in the metropolis for artistic beauty, and is viewed with admiration by all strangers. E. is not a manufacturing town—a circumstance arising partly from its situation, and partly from the constitution of its society, which is essentially aristocratic, literary, and professional. The only businesses carried on to a large extent are printing, with the kindred arts (see BOOK-TRADE), also iron-founding, brewing, tanning, coach-building, and the manufacture of house-furniture, jewellery, and articles in Indian rubber. E., however, derives some commercial importance from its various banks and insurance-offices, round which there revolves no mean part of the monetary capital of the country.

Besides being the place of residence of considerable numbers of the Scottish landed gentry, E. is resorted to for the sake of education, which is carried on to a large extent, both through the agency of public schools and private teachers. The chief educational establishments are the University (q. v.) and Medical Schools, High School, and New Academy. E. is justly celebrated for the high qualifications of its medical practitioners, surgeons as well as physicians; and as the seat of the supreme law courts of Scotland (see COLLEGE OF JUSTICE), it abounds in lawyers of different grades. In late years, painting, sculpture, and other branches of the fine arts, have been largely promoted by the Royal Scottish Academy, which has Exhibitions annually. Among the leading objects of interest are the Castle, in which are shewn the ancient regalia of Scotland; the Parliament House, used by the Scottish parliament previous to the union with England, and now a hall connected with the law-courts; adjoining this, the extensive library of the Faculty of Advocates; the University buildings; the Palace and Abbey of Holyrood (q. v.); the General Register House, where the whole of the rights and pecuniary obligations connected with heritable property are registered, and state documents preserved; the National Gallery of Art; the Royal Institution, containing the apartments of the Royal Society and the Museum of the Society of Scottish Antiquaries. There are several large hospitals for the nurture and education of children, the most important being Heriot's Hospital (q. v.) and Donaldson's Hospital (q. v.). E. has a good theatre, and is otherwise provided with public amusements. In the southern environs, there are fine open links or downs, where the game of Golf (q. v.) has been played from time immemorial. The town, which possesses many good hotels and lodging-houses, and is well supplied with street cabs, is now the centre of railway communication in all directions—distance from London to E. about 400 miles, or 11 to 12 hours by express trains.

In virtue of ancient charters, and modern acts of parliament, E. is a royal burgh with extended municipal bounds, governed by a town council composed of 41 members, who, with two exceptions, are appointed by popular election (ten-pounders). The council elects from its own body a Lord Provost and six bailies, who constitute the civic magistracy. Connected with the corporation there is a police establishment (supported chiefly by assessments on property), to which are attached courts for petty offences and crimes, presided over by bailies. E. is represented by two members in parliament.

In the city there are 13 parishes connected with the established church, the clergy of which are supported by stipends (£600 each per annum) raised from rates. Practically, the town as now extended includes the churches of Canongate and St Cuthbert's parishes, also a number of chapels of ease. In 1861, the entire number of churches and chapels in E. was as follows: Church of Scotland, 26; Free Church, 31; United Presbyterian, 18; other Presbyterian bodies, 3; Scottish Episcopal, 11; English Episcopal, 2; Baptist, 7; Congregationalist, 3; Methodist and Evangelical, 4; Roman Catholic, 3; Unitarian, 1; other bodies (including 1 Jews' synagogue), 6: total, 115, with about 132 ministers. This shews a great increase since 1821, when the entire number of churches and chapels was 50, and the number of ministers 61. In 1821, the population of E. was 112,235; in 1861, it was 167,851.

**EDINBURGH**, THE UNIVERSITY OF, took its rise from a bequest in 1558 by Robert Reid, Bishop of Orkney, of 8000 merks; but the sum was retained for a considerable time by the Abbot of Kinloss. The magistrates of the city, on the faith of receiving the bequest, purchased in 1563 a portion of the ground on which the present university stands. Queen Mary was anxious that the proposed institution should succeed, and bestowed upon it grants of confiscated church property. The university was formally founded by King James VI. in 1582 by royal charter, placed in the hands of the magistracy of the city, and in virtue of which the corporation, up till 1858, remained its patrons or governors. In 1583 the work of instruction began under Robert Rollock, the first regent. Originally, the university consisted of but one class and one regent or teacher. The regent had charge of the students from their enrolment to their laureation at the close of the fourth session of study. As the university prospered, additions were made to the staff of regents, and separate chairs for the several branches were founded. In the beginning of the 17th c., the Senatus Academicus consisted of a principal and four regents. The first theological chair was instituted in 1642, and the first professor of medicine was appointed in 1685. After 1688, the university of E., along with its sister universities, was subjected to a parliamentary visitation. The commission was issued in 1690, and till the close of the century the university was under its control. Under this supervision, a separate chair of Greek was established; and after 1708, the present arrangement of the Faculty of Arts came into existence. About this period, the Faculty of Law was created. During the 18th c., the professoriate rapidly increased; and in 1760, the Senatus Academicus contained 18 professors besides the principal. Nine or ten chairs have been added during the present century. In 1858, an act of parliament was passed, by which the constitution of the university was materially changed. The government was taken out of the hands of the lord provost, magistrates, and town council of the city, and placed in the Senatus Academicus and a university court; and the patronage of the chairs —from 1582 in the gift of the corporation—was transferred to seven curators, three of whom are nominated by the university court, and four by the town council. A general council was also established, consisting of graduates of the university, and all persons who, up till August 1861, could satisfy the university commissioners that they had given attendance on four complete sessions of the university, two of these sessions being in the course of study in the Faculty of Arts. By act of parliament, the university was placed under the regulation of the commissioners till 1862.

*Matriculation, Faculties, Degrees.*—Students entering any class in the university, are required to inscribe their names in the General Matriculation Album of the university, which is the legal record of attendance; and the production of the matriculation ticket admits to the Library, and, on certain days, to the Natural History Museum. The university consists of the Faculties of Arts, Medicine, Theology, and Law. The Faculty of Arts comprises the chairs of Humanity, Greek, Mathematics, Logic and Metaphysics, Moral Philosophy, Natural Philosophy, Rhetoric and Belles Lettres, Universal History, Practical Astronomy, Agriculture, Music; and attendance on the first seven of these is incumbent on every one proceeding to the degree of M.A. The Medical Faculty comprises the chairs of Institutes of Medicine, Materia Medica, Medical Jurisprudence, Chemistry, Surgery, Practice of Physic, Anatomy, Pathology, Military Surgery, Midwifery, Clinical Medicine, Clinical Surgery, Botany, Natural History. The Faculty of Theology comprises the chairs of Divinity, Ecclesiastical History, Biblical Criticism and Antiquities, Hebrew. The Faculty of Law comprises the chairs of Civil Law, Law of Scotland, Conveyancing. The degrees granted by the university are Master of Arts, Bachelor of Arts (this degree will not hereafter be conferred), Bachelor of Medicine, Master of Surgery, Doctor of Medicine, Bachelor of Divinity, Doctor of Divinity, Doctor of Laws.

*Libraries, Museum, Societies.*—The University Library originated in a bequest, in 1580, by Mr Clement Little. The bequest amounted to about 300 volumes. It enjoyed the right of receiving every book entered in Stationers' Hall, but a composition of £575 per annum in lieu of the privilege was subsequently accepted. The University Library contains about 120,000 printed volumes, and 500 volumes of MSS. The university also contains subsidiary libraries, such as, the Theological Library, the Humanity Class Library, &c. The Natural History Museum was established in 1812, and receives a government grant of £200 per annum. The Anatomical Museum was founded by the town council and the Senatus Academicus in 1826. The Botanical Museum is stationed in the Botanic Garden, which is in connection with the university, and several valuable museums exist as appendages to classes. There are several societies in connection with the university, which meet in its buildings during the winter session. The Speculative Society was founded in 1764, the Hunterian Medical Society in 1824, the Scots Law Society in 1815, the Dialectic Society in 1787, the Diagnostic Society in 1816. These societies are commonly called 'the Associated Societies of the University of Edinburgh.'

*Bursaries.*—There are from 106 to 108 bursaries and scholarships connected with the university of E., and the total yearly amount of these may be estimated at from £1800 to £1900. These bursaries are appropriated to the different Faculties, and are in the patronage of the Senatus, the town council, and of private individuals. Their yearly values range from £5 to £100, and they are generally held for a period of four years.

**EDINBURGH REVIEW**, the first of the great critical periodicals which form a distinguishing feature of the literature of the 19th century. It was started in October 1802 by a knot of young men living in the northern metropolis, the principal of whom were Francis Jeffrey (q. v.), Sidney Smith (q. v.), F. Horner, and Henry Brougham (q. v.). So much was secrecy felt or believed to be necessary to the success of the undertaking, that, according to the account which Lord Jeffrey gave to Mr Robert Chambers in 1846, 'the dark divans' of the reviewers were held for some time 'in a dingy room of Willison's printing-office in Craig's Close,' to which each repaired alone, and 'by back approaches or different lanes.' Of the first number, 750 copies were printed: the demand exceeded this limited supply; 750 more were thrown off, and successive editions followed. In 1808, the circulation had risen to about 9000, and it is believed to have reached its maximum—from which it has declined—in 1813, when 12,000 or 13,000 copies were printed. The pay of contributors was at first ten guineas a sheet, but shortly after 'the *minimum*,' says Jeffrey, 'was raised to sixteen guineas, at which it remained during my reign. Two-thirds of the articles were, however, paid much higher, averaging, I should think, from twenty to twenty-five guineas a sheet on the whole number.' The original publisher was the well-known Constable. The political views advocated in the early pages of the *Edinburgh Review* were *Whig*, and to these it has consistently adhered to the present day. Its influence in developing and strengthening the political convictions of the Whig party cannot be over-estimated; but its power was even more visible, certainly more immediately palpable, in literature. Amid the feeble and effete periodicals of the day, it burst like a bombshell. The keenness of criticism, the sharpness of wit, the brilliancy of style, the vigour of mind and comprehensiveness of knowledge exhibited by the writers, excited amazement and fear in the world of letters; and although, in the case of Wordsworth, Southey, and other writers of a certain school, unfairness of a flagrant kind was undoubtedly exhibited and persevered in, yet impartial justice was, on the whole, administered, and the rising generation of authors strained their utmost to escape the lash. Since the period of Jeffrey, the most brilliant contributor to the *Edinburgh Review* was the late Lord Macaulay.

**E'DINBURGHSHIRE**, or **MID-LO'THIAN**, the metropolitan county of Scotland, lying on the south side of the Firth of Forth. Its greatest length from east to west is 36 miles, and its breadth 18 miles, with an area of 397 square miles. From the south border, the Pentland Hills (mean height 1000 feet, and highest point 1839 feet) and the Moorfoot Hills (mean height 800 feet, and highest point 2136 feet) run north-east through the county. In the north are fertile plains, varied by gentle slopes, ridges, and hills of trap. The coast, 13 miles long, is partly sandy, and is studded with towns, villages, and piers. The chief rivers are not above 20 miles long, and are the Esk, Leith Water, Almond Water, and Gala Water. Four great roads and five great railways traverse the county. E. chiefly consists of carboniferous strata, with protrusions of trap. Some lower Silurian rocks occur in the south-east. Coal and iron are chiefly worked in the broad valley of the Esk. Here the bed of coal extends 15 by 8 miles, and contains 33 seams ¾ of a foot to 6 feet thick. The fine sandstone quarries of Craigleith contain large fossil trees, and the limestone of Burdiehouse is famed for fossil fishes. Cold and dry east winds prevail in spring. Clay-soil predominates. The county is chiefly agricultural, with large farms. The harvest is a week earlier on the coast than at the height of 200 feet, and a fortnight earlier than at the height of 600 feet. Near the metropolis are extensive nurseries, vegetable and fruit gardens, and dairy pastures. In 1857, two-fifths of the county was in crop, the chief crops being oats, turnips, barley, wheat, beans, pease, and potatoes. Pop. (1861) 273,869. In 1851, E. had 259,435 inhabitants; 230 places of worship (66 Established, 49 Free, 40 United Presbyterian); 399 day-schools, with 37,274 scholars. E. returns one member to parliament for the county. It contains 44 parishes. The chief towns are Edinburgh, the metropolis of Scotland; Leith, its seaport; Dalkeith, Musselburgh, and Portobello. In E. have been found cairns, stone circles, Roman coins and utensils, and traces of Roman camps and burying-places. E. was included in the Roman province Valentia, and Cramond is supposed to have been a chief Roman port. It afterwards formed part of the kingdom of Northumbria, 446—1020, the Anglo-Saxons from the north of England coming to settle here. The county contains many feudal and ecclesiastical remains, as Borthwick Castle, Craigmillar Castle, Crichton Castle, and Roslin Chapel.

**E'DISTO**, a river of South Carolina, flows through the south-west part of the state, being formed near Branchville of the North Edisto and the South Edisto, and entering the Atlantic by two arms respectively named from the two confluents. Edisto also designates the island which separates those two arms. The stream is navigable for 100 miles upwards, and its mouth is about 20 miles to the south-west of Charleston.

**E'DMONSTONE ISLAND**, an outpost, as it were, of the Delta of the Ganges towards the Bay of Bengal, is situated at the mouth of the Hoogly, the most westerly arm of the great river above mentioned. It is the arena of a continuous conflict between the fluvial currents and the oceanic tides. From being merely a sand-bank, it came, not many years ago, to be covered with shrubs, and even to yield a supply of fresh water. After having been adopted, under this new phase, as a marine station, it has since then been abandoned, in consequence of the encroachments of the sea. E. I. is in lat. 21° 32′ N., and long. 88° 20′ E.

**E'DMONTON**, a large village in the north-east of Middlesex, near the Kerr, 7 miles north-north-east of London. Pop. of parish (1861) 10,919. It contains many villas of London merchants, &c. Charles Lamb is buried in the churchyard here. E. is connected with Cowper's humorous poem of *John Gilpin*.

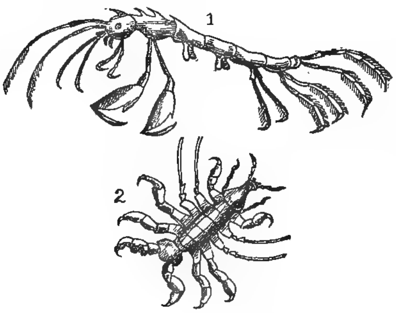
**E'DMUND I'RONSIDE**, king of the Anglo-Saxons, son of Ethelred II., and half-brother of Edward the Confessor, was born in 989. He calls for notice chiefly as the great opponent of Canute and the Danish party. On the death of Ethelred, the Danes proclaimed Canute king of England; but the citizens of London declared for E., who drew together his forces, and engaged Canute, first at Pen, in Dorsetshire (or, as other accounts say, at Gillingham, in Somersetshire), then at Sceorstan, and again at Ottenford, or Otford, in Kent, in all of which battles he was victorious; but a severe defeat which he sustained at Assandun, in Essex, compelled him to a compromise with his adversaries. An arrangement was entered into by which England was divided between the two kings, Canute obtaining possession of Mercia and Northumbria, the rest falling to the share of Edmund. It was also agreed that on the death of either, the survivor was to succeed him. E. having died a few weeks after this agreement had been drawn up, Canute became king of all England. E. received the surname of *Ironside*, either from his great strength or from the colour of his armour.

**EDMUND'S (St) HALL**, Oxford, derives its name from St Edmund, Archbishop of Canterbury in the reign of Henry III. As early as 1269, it appears to have been purchased by the canons of Osney, and devoted to purposes of education. On the dissolution of religious houses under Henry VIII., it fell into the hands of two citizens of Oxford, who sold it to William Denyse, provost of Queen's College. The provost devised it to his college, and that society accordingly now nominates the principal of St Edmund's Hall. There are ten exhibitions attached to the hall, value £30 per annum, appropriated to students designed for holy orders, and in the gift of the principal. In 1860, there were about seventy names on the books.

**E'DOM** (New Testament, Idumæ'a), a word signifying 'red.' It was, according to Gen. xxv. 29—34, the name given to Esau on account of the *red* pottage supplied to him by his brother Jacob. Hence, the country which Esau afterwards obtained was called the land of Edom, but previously Mount Seir. The ruddy hue of the mountain-range, however, may have had something to do with the naming of the region. E. comprised a strip of country 100 miles long by 20 broad, lying between the south of Palestine and the Gulf of Akabah (an arm of the Red Sea). It is a wild, mountainous region, with the desert on the east and west of it; but rugged though it looks, it contains rich glens and terraces, where flowers, and shrubs, and trees spring up luxuriantly. Its capital was Bozrah (now Buseirah), in the extreme north; its seaports were Elath and Eziongeber, in the extreme south, at the head of the Gulf of Akabah. During the reigns of David and Solomon, E. appears to have been under subjection to the Israelites; but when the kingdom of Israel began to decline, the Edomites repeatedly ravaged the southern borders of Palestine, which circumstance is perhaps the reason why they are so terribly denounced by some of the prophets. At a later period, the term Edom (now giving way to the Greek form Idumæa) designated the region between the Gulf of Akabah and the Mediterranean, including a part of the south of Palestine. The revival of Jewish power under the Maccabean princes once more brought

Idumæa under Jewish sway. The people were compelled to conform to the laws and customs of their conquerors, and the country was for the future ruled by Jewish prefects, one of whom, called Antipater, who was born in the country, acquired the friendship of the Roman emperor, and was appointed procurator of all Judæa. His son was the famous Herod the Great, 'king of the Jews.' In the 7th c. A.D., E. was overrun by the Arabs, and has ever since shared the fortunes of Arabia.

**EDRIOPHTHA'LMA** (Gr. sessile-eyed), a section of the class of Crustaceans, consisting of those *malacostracous* crustaceans which have the eyes sessile—not mounted upon stalks. They also differ from the other malacostraca in having the organs of respiration connected with the organs of locomotion; some of them, which constitute the two orders *Amphipoda* and *Lœmodipoda*, having the respiratory organs connected only with the true or thoracic legs, whilst in the remaining order, *Isopoda*, they are connected only with the abdominal or false legs. The E. are generally marine; many of the *Amphipoda*, however, are inhabitants of fresh water; some of the *Isopoda*—as the armadillo and woodlouse—are terrestrial, but are inhabitants of damp places. Many both of the marine and fresh-water species spend their lives rather among the weeds and decaying matters of the shore than in the water, to consume these being apparently their office in the system of nature; some have organs adapted for leaping and for burrowing in the sand, as the common Sandhopper (*Talitrus locusta*), one of the *Amphipoda*, of which countless myriads are to be seen on all our sandy shores, attracting the admiration even of the most careless; some burrow in more solid substances, as the *Limnoria terebrans*, one of the marine *Isopoda*, which too frequently effects the destruction of piers, dock-gates, &c., perforating them in every direction. Many of the E. are parasitic, some of them on whales, some even on prawns and other crustaceans. Some of the parasitic E. are destitute both of eyes and antennæ.



Edriophthalma:
1, Caprella phasma; 2, Cyamus Balænarius.

**EDRISI**, ABU ABDALLAH MOHAMMAD BNU ABDALLAH BNU EDRIS, AL-HAMUDI, SHERIF, also called AL-EDRISI, AL-SIKILI (SICILIAN), or AL-RODJARI (ROGER'S), one of the most eminent Arabic geographers, and a descendant of the royal family of the Edrisites—who traced their origin to Mohammed himself—was born at Ceuta or Sibta (Civitas) in the year 1099. He studied at Cordova, and early distinguished himself by the extraordinary range and versatility of his talents. He excelled in nearly all the then known branches of science and art; but it was geography which at a very early age seems more than any other science to have attracted him. Having completed his studies, he travelled and visited Constantinople, Asia Minor, Egypt, Morocco, Andalusia, and the coasts of France and England. Roger II., king of Sicily, invited him, on his return, to his court, and lavished upon him all the honours which it was in his power to bestow. A favourite wish of this monarch—one of the most refined and liberal-minded men of his age—had long been to have a representation of the earth, founded on the most recent observations. He accordingly invited travellers from all parts of the world to assist him by sending their itineraries, their measurements of longitudes and latitudes, their observations and adventures—in short, all they had seen or heard on their journeys. The collection of this material occupied fifteen years, at the end of which it was handed over to Edrisi. Thus guided, he drew up a map, on a globe of pure silver, weighing 450 Roman pounds (50,400 drachmas), in which the whole of the then known world was represented. He, like Ptolemy, divided it into seven climates, beginning at the equinoctial line, and continuing northwards to the limits of extreme cold, and intersected each of these with eleven 'regions,' represented by perpendicular lines, without any regard to the political or physical features of the respective countries. In explanation of this map, he wrote a book (1153), *Nuzhat al-Moshtak*, &c., in which a full account is given of the towns, mountains, rivers, &c., proceeding from west to east, according to the order of the climates. Careful as he was in observing and collecting, he could not, in the then state of society and communication, but fall occasionally into serious blunders; but on the whole his statements are peculiarly trustworthy; and being the clearest and most reliable exposition of the state of geographical knowledge in those days, the book remained the great and sole authority down to the time of the Portuguese discoveries. An extract of it was first edited at Rome in 1592, in Arabic, entitled *Nubian Geography*, and reprinted in the monastery of Khesruan, in the Lebanon, with Syriac characters, in 1597—both editions incorrect in the highest degree. The very title was a mistake, the editors having, by a misinterpretation of a passage, been led to believe that E. was a Nubian. Bernardino Baldi translated this extract into Italian in 1600, but his translation was never published. The first published translation was a Latin one, made in Paris (1619) by Gabriel Sionita and Johannes Esronita, a work teeming with the most absurd blunders; and Domenico Macri translated this Latin translation into Italian. Rosario Gregorio's Latin version of the portion referring to Sicily was published with the text in a collection of Tardia in 1790. Hartmann wrote an excellent Latin commentary on the portion treating on Africa (Göttingen, 1791 and 1796), and another on the first three chapters of Spain (Marburg, 1802—1803). The entire description of Spain was published with a translation by J. Antonio Condé (Madrid, 1799).

The translation of E.'s whole work, in French, was made from two MSS. in the Imperial Library, by Jaubert, and published (Paris, 1830 and 1840), but it is unfortunately not sufficiently faithful. The full text has never been edited.

We shall only add that the incidents of E.'s life have given rise to interminable discussions. The year and place of his death, as also his creed, whether Mohammedan or Christian, still remain vexed questions. Chief authorities regarding E. are Hadji Kalifah, Schnurrer, De Sacy, Slane, Quatremère, Reinaud, Amari, &c.

**EDUCA'TION** is an art, the art, namely, of drawing out (Lat. *educere*) or developing the faculties—of training human beings for the functions for which they are destined. Now, in order to the perfection of an art, it must be founded on a corresponding science; and of nothing is this more true than of education. Before we can hope to mould a human being in a desired way, the nature of that being must be well known. The knowledge of man's nature is usually comprehended under three divisions: the constitution of his body (physiology); the constitution of his mind (psychology); his moral and religious nature (ethics and religion). If we suppose these branches of knowledge thoroughly investigated, they would furnish the solution of the two main points on which all questions of education turn: first—What are the dispositions and acquirements which it is most desirable to implant and foster? in other words, What is the end or aim that the educator ought to pursue? and second—What are the best means to attain that end? But the sciences above named are themselves in too imperfect and unsettled a state to be the basis of any theoretical plan that would be generally accepted; for our knowledge of living beings, and still more of moral beings, must, as is now well understood, be the last to acquire the shape and certainty of science. See SCIENCE. It is needless, therefore, to look as yet for any complete theory or *philosophy of education.* Education has existed as an art from the very infancy of society, but it is as yet mostly an empirical art, the rules and methods of which have been arrived at by the blind groping of experience—by the process of trial and error. The art of education is still in the condition in which the art of agriculture was until the present century, when, by the aid of chemistry and vegetable physiology, then arriving at something like perfection, a scientific foundation was laid for it by Liebig and others. Even were the sciences of physiology, psychology, and ethics, on a more satisfactory footing, they would not be immediately serviceable as a foundation for a theory of education, without a preliminary step. This would consist in deducing from them an intermediate science, embodying the *laws of the formation of character.* According to J. S. Mill, it is a body of doctrine of this nature, to which he proposes to give the name of Ethology (Gr. *ethos*, habit, custom), that would properly be 'the science of which education is the art.' But so far is such a science from being yet constructed, that it is only lately that the necessity for it has been pointed out. Notwithstanding this lack of scientific foundation, the practical art of education has, in recent times, undergone great improvement in almost all its details. It is chiefly in discussions on the subject that the want of fixed scientific principles makes itself felt. A debate on any topic connected with education usually presents little but a hopeless chaos of conflicting opinions, the most inconsistent arguments being often urged in favour of the same view. What renders the confusion greater, education is a subject on which every one thinks himself or herself capable of pronouncing an opinion. But this is only another indication of the want of fixed scientific principles. No one presumes to meddle with a question of astronomy or of chemistry unless he has made it the study of a life. In like manner, it is to be hoped that, in proportion as we advance to a philosophy of education, there will be fewer who will take upon themselves to settle off-hand the most difficult questions regarding it.

In the present article, we can do little more than notice the chief divisions into which the subject of education naturally falls, together with the leading questions that give rise to differences of opinion.

*Definition.*—It is necessary at the outset to limit the application of the term education. In the widest sense of the word, a man is educated, either for good or evil, by everything that he experiences from his cradle to his grave. But in the more limited and usual sense, the term education is confined to the efforts made, of set purpose, to train men in a particular way—the efforts of the grown up part of a community to inform the intellect and mould the character of the young; and more especially to the labours of professional educators, or schoolmasters. It is evident, however, that school education cannot be understood or practised rightly except by those who have mastered the idea of education in its widest sense. It is only the educator who can appreciate the influences which have gone before his own, which are running parallel with them, and will come after them, that is in a position to judge of the course to be pursued.

*Moral Training.*—The means employed in education fall naturally under two heads: discipline, or moral training; and instruction, or the imparting of information; although the two often run into each other. Under the head of discipline, come the forming of habits of order, self-control, obedience, civility, love of truth, and reverence for what is good and great. All but the mere outward forms of these is beyond the power of direct teaching; they are imbibed through the silent influence of example. The child instinctively respects and reverences what it sees others respect and reverence; above all, the unselfish affections are called forth only by the breath of affection from without. In this part of the process, it is evident that the school and the professional educator only play a part along with other influences. Nor do they even play the chief part; the home and neighbourhood are here the predominant educators.—We cannot here enter into the vexed question of the teaching of religion in schools; it falls under the head of NATIONAL EDUCATION; as does also the question between voluntary and state schools.

As the process of moral development, through the general surrounding influences, is for the most part unconscious on the part both of those who act and those who are acted upon, it has not yet secured the attention it deserves; in fact, the other branch of the subject, viz., instruction, or intellectual education, being more particularly the business of the schoolmaster, has come in common language to usurp the whole field, so that, by education, we seldom mean more than the imparting of information—instruction.

*Instruction.*—The business of instruction involves two main considerations—1. What to teach? and 2. How to teach it?

1. Of the vast mass of truths composing the sum of human knowledge, which are to be selected as the *encyclopædeia* or curriculum of study for youth? In determining this question, it is to be borne in mind that every truth learned serves two uses—as knowledge to be acted upon, and as mental discipline. In selecting, then, what to teach, we have to consider, not only what is in itself most useful, but also what has the greatest degree of improving effect. On this point, we agree with a recent writer, that 'we may be quite sure that the acquirement of those classes of facts which are most useful for regulating the conduct, involves a mental exercise best fitted for strengthening the faculties.' If this is true, the prominence given to the teaching of the dead languages of Greece and Rome, in modern education generally, is more than questionable. It is not disputed that a course of the classics, well taught and well learned, is a good intellectual discipline; but so is any kind of knowledge, well taught and well learned, a good intellectual discipline—better than more valuable

knowledge imperfectly taught and learned. The question is, whether an equally good culture of the faculties would not be got from a systematic course of equal duration of English and other modern languages, together with logic and moral and physical science. In this case, the subject-matter of the teaching would be an acquisition of great value in after-life to every one, which cannot be said of the other. In the learned professions, no doubt, and for those following literary pursuits, a knowledge of Greek and Latin is of direct use, and will doubtless continue an indispensable element of education; but perhaps three-fourths of those who receive what is called a 'liberal' education, and therefore devote the strength of six or seven years to Greek and Latin, never open a book in these languages from the time they leave school. We are not prepared to maintain that the same effects in the way of discipline have as yet been actually produced, on any great scale at least, by the teaching of science and of modern languages, as result from the drill of the classical schools; but we believe that this arises from the fact, that no such course of instruction has hitherto been pursued with the same system and perseverance which characterise classical schools.

In respect of direct utility, the things most necessary to know, are those that bear most directly—

1. On the preservation of life and health, and the proper performance of the more common industrial labours. This involves a knowledge of our own bodies and of the bodies of which the universe is made up; in other words, more or less of the knowledge which, when put into systematic forms, is known as the sciences of physiology, natural philosophy, and the other physical sciences.
2. A knowledge of our moral relations. Besides a knowledge of the ordinary moral duties, and the high religious sanctions with which they are enforced, this implies some acquaintance with the laws of economy.
3. As a preliminary step, and as the medium through which all other knowledge is conveyed, there is required a knowledge of the mother-tongue, and the faculty of reading and writing it. Allied to language is a knowledge of counting and measuring, and the naming and classifying of the objects of which the world is composed (natural history), together with a knowledge of the countries and places on the earth's surface (geography).
4. The cultivation of the taste and the imagination, or the faculties which derive pleasure from music, painting, sculpture, architecture, poetry, and works of fiction.

Under the head SCIENCE will be given a complete tabular view of the various branches of human knowledge or sciences, together with the corresponding arts or applications. It will there be shewn that there is a natural order of dependency among the fundamental sciences, which determines the order in which the different kinds of facts should be taken up in learning. (An admirable mapping out of the whole field of knowledge in relation to Education, is given by Dr Neil Arnott in his *Survey of Human Progress.* Lond. 1861.)

The different offices and employments characteristic of an advanced state of society, require a corresponding difference in the amount of knowledge and skill possessed by those who are to fill them—a difference which is vaguely and inadequately expressed in the usual division of schools into primary schools, middle or higher schools, and universities.

A course of primary instruction embraces only what is considered absolutely indispensable. Not that there is a limit to the degree of intelligence that is desirable in any class of the community; but for those who must, from early years, spend most of their time in manual labour, i. e., for the vast majority of the race, there is a very short limit to the degree possible. The grand question here would be to determine the order of desirableness of the different subjects to be taught, so that, beginning with the most indispensable, more and more might be added as circumstances would permit. Until recently, reading, writing, and arithmetic were considered the beginning and end of a course of primary instruction. These, however, are not so much knowledge themselves as instruments for acquiring knowledge; and therefore the primary teacher in the present day considers it his duty to give, in addition, as much information of a directly useful kind as possible. But in avoiding one error, he not unfrequently falls into the opposite; for, after all, the three branches above named are the first and most indispensable steps in instruction. Those who can read and write may acquire information after leaving school. Reading and writing, unless learned at school, are, as a rule, never learned; and thus the grand access to knowledge remains for ever shut. Nor is it enough to have made a beginning in the arts of reading, writing, and counting; unless such a degree of facility is acquired before leaving school as to render the exercise a pleasure, it is not kept up in after-life, and the little that was learned is soon forgotten. We believe that in all schools, but especially where the children are liable to be early withdrawn, everything else ought to be held secondary until the painful stage in learning to read, write, and count is fairly got over. With regard to the positive knowledge hitherto got in primary schools, there is a general feeling that few teachers succeed in giving it a direct bearing on the actual concerns of life. Hence the aversion expressed in many quarters to the introduction of the 'ologies' into common schools, and the rather vague demand for the teaching of 'common things.'

Middle or secondary schools either serve for those who have leisure for a higher degree of culture than the elementary course above described, or they serve as nurseries for the highest kind of educational institutions, viz., the universities. Under the head of secondary schools may be ranged the institutions that go by the names of high schools, academies, grammar-schools (the *gymnasiums* of Germany, and the *colleges* of France). In these, the course of instruction usually embraces other languages besides the mother-tongue, and more or less of the elements of the various sciences. The titles of a series of text-books, such as those composing Chambers's *Educational Course*, give a notion of the great variety of subjects that are considered requisite in middle-class education. Much yet remains to be done to chalk out a judicious course of middle-class instruction—sufficiently wide to be a foundation for after-acquisitions, and yet not so multifarious and detailed as to be impossible to overtake except as ill-digested cram.—Where preparation for the university is the object, Greek and Latin are the chief subjects of attention.

The highest degree of culture is represented by the Universities (q. v.).

*Special or Technical Education.*—Up to a certain point, the education of all young persons is, or ought to be, substantially the same; for the end in all cases is to train them up to be intelligent, virtuous, and active men and women, capable of turning their talents to account in whatever situation they may be placed. But in all civilised societies, the duties and employments are so diverse, that the members must begin betimes to receive special training, according to their future destination. This special training is either of an intellectual or a mechanical kind, or it may partake of both. This branching off of education into special tracks is conspicuous in the higher education given in universities, where from the very first there have been—besides the Faculty, as it is called, of Philosophy, including a number of branches of a general nature—special departments or faculties of Law, Medicine, and Theology. But besides these 'professions,' as they are styled, a number of branches of industry have in recent times, by the application of scientific processes, and from other causes, risen into a condition which requires, at least for those who are to direct them, a special range of instruction and information; such are engineering, mining, chemistry applied to the arts (technology), for which special schools are now established in most centres of industry. There are two 'specialties' which, from the immense numbers engaged in them, assume unwonted importance—namely, Agriculture (see AGRICULTURAL SCHOOLS), and Commerce. So prominent a place does commerce hold in this country, that any school which is above an elementary school, and at the same time not a classical school, usually gets the name of commercial. The chief points in a special education for the mercantile life are usually held to be, facility in writing and calculating, and a knowledge of book-keeping. What would seem to be the most essential part of a mercantile education, is usually neglected—the principles, namely, of political economy—the science of wealth.

*Industrial Education.*—The acquiring of mechanical skill for a particular handicraft or occupation—in other words, apprenticeship—is, properly speaking, a part of education; but as it is not usually begun until the school education is considered finished, it hardly falls within our province. Yet the abrupt separation of these two stages is attended with evils that are beginning to make themselves felt. For, first, the poorer classes, either from necessity or cupidity, are induced to withdraw their children from school as soon as their labour can be turned to any account; so that, in the language of one of Her Majesty's Inspectors of Schools, 'in that branch of the population to which public measures apply, all education ceases before the age of twelve, and more commonly at nine years of age.' When to this is added the irregular attendance even during the few years that they are nominally at school—from three to four days a week is the average—the result is, that this class remain virtually uneducated; comparatively few have got over the initial mechanical difficulties of reading and writing, so as to keep up the habit in after-life, and thus they soon lose the little acquirements they had made.

On the other hand, to continue the intellectual and moral education of youth up to the age of fourteen or sixteen, as is the common practice among the middle classes, and among the well-to-do of the artisan class, and then abruptly to break this off, and begin at once an industrial occuption on the full time of an adult who has been used to the work, is, on the face of it, an irrational way of proceeding. The power of applying steadily, day after day, to one occupation, is the hardest lesson for man to learn; it is that which, more perhaps than anything else, distinguishes civilised man from savage and semi-barbarous man; and as the boy is 'the barbarian of the civilised community,' this aversion to steady industry is yet strong in him. It is surely wise, then, to break him into it gradually; to begin, while yet his school education is going on, by short exercises of his industrial faculties at first, and gradually increase the daily hours of work as his physical strength and powers of will become hardened. We believe that many a youth who, on the usual system, breaks down at the very commencement of his industrial career, runs away from his apprenticeship, and becomes unsteady, idle, perhaps a *scamp*, for life, might, by a gradual initiation, have become an industrious man and good member of society. So far, again, would this plan be from infringing upon the usual education given at school, that it is only in some such way that, in a country like ours, the school education of those who have to earn their own bread can be prolonged to the age necessary for learning much that every member of the community should know.

Theoretically, we believe it to be indisputable, that school education and industrial training ought, for some time at least, to be conjoined. How to make them dove-tail into one another in practice, is one of the chief educational problems of the day. One step towards it has been made in the *half-time system* enforced by act of parliament with regard to children employed in factories. Children may be employed as early as the age of eight years, but the mill-hours of all between the ages of eight and thirteen are limited to six hours and a half daily; nor can they be employed even for that length of time but on condition of receiving three hours' schooling daily. Experience has established the fact, that in proportion to the hours spent in school, these 'half-timers' learn much quicker, and make more rapid progress, than the whole-day scholars; at the same time, whether they are destined to be factory-workers for life or not, they are acquiring habits of industry and manual dexterity which are of essential use in any future employment.

Industrial training is now conjoined, to a greater or less extent, with school-teaching in almost all institutions for the education of pauper children—parochial union schools, ragged schools, as well as in professedly industrial schools. See INDUSTRIAL SCHOOLS, RAGGED SCHOOLS, REFORMATORIES. The chief difficulty in this movement is to find fitting work. And here it may be observed, that the object is not to teach particular trades with a view to the boys following these in after-life; this, though it were desirable, would obviously be impracticable as a general system. The object is, to promote the health, to develop the strength of the muscles, and give them pliancy and general docility, and to induce habits of steady and patient endurance of work.

The industrial training of girls is of yet more urgent necessity than that of boys. The ordinary domestic operations involved in household management ought naturally to be learned at home under the guidance and example of the mother; and the object at school, in a right and normal state of things, would be to initiate the girls in things, in the way of improvements, that their several homes might not exhibit—to insure progress, in short. But unhappily, in the homes of the great mass of the operative population of these islands, the mother is at present quite unfit for this primary duty. The extension of the factory system of work, instead of the domestic, has revolutionised the domestic life of a great part of the operative population, and with our *laissez-faire* policy in education, we have allowed a generation to spring up, in which a great part of the married women have lost whatever traditional housewifery their mothers might have had, and can neither cook, wash, nor sew. The consequence is, that the food of the household is unsavoury, indigestible, innutritious, and at the same time unthrifty; while the whole *ménage* has that character of untidiness and discomfort that often drives the husband to the pot-house. For girls of this class, there is needed a training in some public institution in the very elements of housewifery; while, for all classes, there is great need for instruction in a better style of cookery than that generally prevalent. Among the 'common things' taught to all girls ought to be, how to spend a given weekly income on a given household to the greatest advantage. See DOMESTIC MANAGEMENT.

2. 'How to teach it.'—It is a great error to suppose, that because a man knows a thing, he can therefore teach it. Teaching is one of the most difficult arts, and requires natural aptitude and acquired skill. The necessity of special study and practical training or apprenticeship to make a schoolmaster, is a discovery of recent date, and has given rise to teachers' seminaries or Normal Schools (q. v.), where they receive special instruction in the most approved methods of teaching, and practice in their application. It is to the greater acquaintance with right methods, on the part of schoolmasters, that we are to look for the solution of one of the greatest difficulties—how, namely, to overtake all the work that is necessary to be done in the school-period of life, without keeping the learners too many hours a day at their tasks. As things are usually managed, very little of the time devoted to lessons is spent in actually learning anything whatever; as any one may satisfy himself by calling to mind how his own time was spent while seated on the school-benches. There is here a rich mine waiting to be worked—the gold-fields of future generations. It is not to be disputed, that three hours of hearty, spirited exertion will do more, in the way of learning, than is accomplished in six hours in most schools. The three hours thus set free would be clear gain; for time spent in trifling or in heartless fagging is utterly lost. The child is all the while plagued without being profited, and would be better employed in being happy in his own way. This matter of the happiness of the young has not yet received the attention it deserves in schemes of education. As Sidney Smith has well expressed it, 'if you make them happy now, you make them happy twenty years hence, by the memory of it;' so that while looking after the formation of other valuable habits, the educator must not overlook the habit of happiness.

Increased economy of time in teaching, besides setting free sufficient time for play, would admit the more general introduction into school education of military drill (including gymnastics). This, in addition to its immediate purpose (see VOLUNTEERS), would be a most valuable aid in moral education, by promoting habits of prompt obedience, order, and politeness. On this subject, see *Communications from Edwin Chadwick, Esq., respecting Half-time and Military and Naval Drill*, made to the Education Commission, and printed among parliamentary papers. 1861.

For further information on the subject of this article, see, in addition to the references already given, the heads INFANT SCHOOLS, EVENING SCHOOLS, LANCASTERIAN AND MADRAS SYSTEMS, PESTALOZZI, HAMILTONIAN SYSTEM, &c.

**EDUCATION,** MILITARY, is now superintended, so far as concerns regimental schools, by a particular department of the War Office. In this sense, it does not really mean military education, but schooling of a humble kind supplied to soldiers and their children. In its proper sense, the term relates to the professional training of those destined to be officers in the army. This is not to so great a degree under government control in England as in continental countries. See ARTILLERY, SCHOOLS OF; CADETS' COLLEGE; CROYDON (Addiscombe); DUKE OF YORK'S SCHOOL; MILITARY SCHOOLS; REGIMENTAL SCHOOLS; SANDHURST; STAFF COLLEGE.

**EDU'R,** a Rajput state of Guzerat, is tributary to the Guicowar, being, in common with his immediate dominions, subject to the political superintendence of the presidency of Bombay. With a revenue of nearly £25,000, it maintains a force of about 1000 men. Its capital, of the same name, containing about 10,000 inhabitants, is in lat. 23° 50′ N., and long. 73° 3′ E.

**E'DWARD THE CONFE'SSOR,** king of the Anglo-Saxons, was born at Islip, in Oxfordshire, about the year 1004. On the death of his father, Ethelred, in 1016, Canute the Dane obtained possession of the throne, and in the following year married Emma, the mother of Edward, by whom he had two sons, Harold and Hardicanute. Until the death of Canute in 1035, E. lived in Normandy; he then made an ineffectual attempt to establish his authority in England; but his mother Emma had now transferred her affections to her younger children; and she exerted all her influence and energy in favour of Hardicanute, who, on the death of his brother Harold in 1040, became sole ruler of the Anglo-Saxon kingdom. Hardicanute, however, was generous enough to invite his half-brother to England, whither accordingly E. went, and was honourably received. On the death of Hardicanute in 1042, E. was declared king. The person chiefly instrumental in bringing about this result was Earl Godwin, whose only daughter, Editha, was married to the king in 1044. The lady only became his queen, not the partner of his bed. For this revolting asceticism, the honour (if it be such) of canonisation, and the title of Confessor, was conferred on him, about one hundred years after his death, by Pope Alexander III. Scrupulous as E. was in regard to one of the passions, he had no repugnance to gratify another of a far less justifiable kind. His first act after his accession, was to deprive his mother of all her treasures—lifting even the cattle and corn from her fields, and, according to some accounts, endeavouring to compass her death. The whole of E.'s reign is simply the record of the growth and struggles of the Norman or court party with the national or Anglo-Saxon party; for an account of which see articles GODWIN and HAROLD. E.'s wars with the Welsh in 1057 and 1063, and with the Northumbrians in 1065, were short and successful. He died 5th January 1066, and was succeeded by Harold, son of Earl Godwin. The prosperity which England enjoyed during the reign of E. was owing to its not being exposed to the wasteful calamities of foreign invasion, while its free intercourse with France, or at least with Normandy, greatly civilised and refined the somewhat Bœotian habits and manners of its inhabitants.

**EDWARD I.,** king of England, was the eldest son of Henry III. by his wife Eleanor, daughter of Raymond, Count of Provence, and was born at Westminster, June 16, 1239. That union of valour and intelligence which characterised him was exhibited at an early period. At the commencement of the struggle between Henry and his barons, Prince E., who was then governor of the duchy of Guienne, came over to England, and boldly declared his dissatisfaction with his father's conduct. Subsequently, he took the king's side in the war, and by his vigorous generalship put an end to the insurrection in a few years, but there is no evidence to shew that he had changed his opinion of Henry's policy; and it is remarkable that he himself, during the whole of his reign, carefully avoided coming into collision with his nobles. When the last of the Crusades was organised, at the instigation of Pope Gregory X., Prince E.

arranged with Louis, king of France, to take part in it. Louis died before reaching Palestine, but the former landed at Acre in 1271. Nothing, however, of any consequence was achieved; and in the following year he set out on his return to England. At Messina, he heard of his father's death, whereupon he proceeded to France, and did homage to Philippe III. for his French possessions, arriving in England 25th July 1274. He and his queen, Eleanor, were crowned at Westminster on the 19th of August following. His first military expedition, after his accession to the throne, was directed against the Welsh. After a contest of nearly ten years—in the course of which the famous Prince Llewellyn was slain at Llanfair, 11th December 1282—Wales was finally subdued and incorporated with England. His next ambition was to possess himself of Scotland. The death, in 1290, of Margaret, granddaughter of Alexander III., and known as the Maiden of Norway, who was to have been married to E.'s son, seemed to have frustrated his design; but the selfishness of the ten competitors for the Scottish crown who now appeared, induced them to acknowledge E. as *Lord Paramount* of Scotland, each hoping that he would thereby secure the English monarch's support. The competitors were also foolish enough to make him umpire among them, or perhaps it would be more correct to say, they were not powerful enough to refuse his arbitration. Be that as it may, E. decided in favour of John Baliol at Berwick, 17th November 1292; and Baliol immediately took the oath of fealty to him; and on the 26th of December did homage to the English king for his crown at Newcastle. The patriotism and pride of the Scottish nation took fire at such humiliation, and in a short time Baliol was hurried by his subjects into a war with England. In 1296, E. entered Scotland, devastating it with fire and sword. He penetrated as far north as Elgin, compelled Baliol to resign the kingdom, and governed the country by means of his own officers. It was during this expedition that he carried off from the cathedral of Scone the celebrated stone on which the kings of Scotland used to be crowned, and which is now in Westminster Abbey. A second rising took place in Scotland in the following summer. The leader on this occasion was William Wallace (q. v.), whom tradition represents as the most heroic and unselfish of patriots. He was completely successful for a time, chiefly it is to be supposed on account of the absence of Edward. In the spring of 1298, however, that sovereign again made his appearance in Scotland, and gave battle to Wallace at Falkirk, on the 22d of July. Partly through treachery, and partly, no doubt, through the superior generalship of E., who is considered to have been the first military commander of his time in Europe, the Scottish forces were entirely defeated. The next five years were spent by the English king in reducing the country to obedience—with very imperfect success, however. In the summer of 1303, he led a third large army into Scotland, and once more spread havoc and ruin to the shores of the Moray Firth. The last castle that held out against him was Stirling, which did not yield till the 20th of July 1304. E. wintered at Dunfermline. Some time after this, Wallace either fell into his hands, or was betrayed, and on the 23d August 1305, was hanged, drawn, and quartered as a traitor, at Smithfield, in London. E. now probably thought that he had no further danger to dread from Scotland, but if so, he was quickly undeceived. Robert Bruce, Earl of Carrick, grandson of the chief rival of Baliol, suddenly left the English court, where he had been residing, in the beginning of 1306, unfurled once more the banner of Scottish independence, and on the 27th March of that year was crowned at Scone. An English army, under the Earl of Pembroke, was immediately despatched to Scotland; and at the close of the year, the king himself set out to chastise Bruce. But worn with the 'sturt and strife' of many years, the cares of his own kingdom, and the anxieties of conquest, E. only lived to reach Burgh-on-Sands, a village beyond Carlisle, where he expired, 6th July 1307, 'in sight of that country,' says Lord Hailes, 'which he had devoted to destruction.'

E. possessed most of the qualities that go to form a great ruler: valour, prudence, inexhaustible energy, and pertinacity are visible in his whole career. He was ambitious, it is true, but in his age, ambition was looked upon as a virtue rather than as a crime; it was the natural accompaniment of kingly courage. His relations to Scotland were also unfortunate. Few people of any understanding, however, now doubt that the best thing possible for that country would have been a peaceful union with England, for at that time there was no hatred or jealousy between the two nations. The death of the Maiden of Norway destroyed every chance of such a union, and the great mistake committed by E. was his endeavouring to bring about by force what could prove beneficial only when it was the result of voluntary agreement. The effect of his mad endeavour was to plant in the breasts of the two nations the *germs* of a hitherto unknown hostility, which, in subsequent generations, worked incalculable mischief, and the traces of which have not wholly disappeared even at the present day. As a civil ruler, E. is entitled to the highest praise. Immense progress was made during his reign in the establishment and improvement of law and order throughout the land, the reformation of civil abuses, and the restriction of ecclesiastical jurisdiction and encroachments. He has been called the English Justinian; and both Hale and Blackstone affirm, that 'the very scheme and model of the administration of common justice between man and man was entirely settled by this king.' Ireland and Wales participated in the benefits of English law. It was during E.'s reign, too, that the representation of the Commons of England first became regular; but probably the greatest advantage obtained by the nation, was the declaration that the right or privilege of levying taxes resided in the parliament. In general, it may be said that E. ruled in harmony with the ideas and desires of the best heads among his nobles and burgesses; and though touchy on the question of his prerogative, like every Plantagenet, and very cruel in his treatment of the Jews, he must be regarded, on the whole, as one of the most enlightened, liberal, and sagacious monarchs of his age.

**EDWARD II.**, son of the preceding, was born at Caernarvon, in Wales, 25th April 1284, and in 1301 was created Prince of Wales, being the first heir-apparent of the English throne who bore that title. He accompanied his father on his various expeditions into Scotland, and on the death of the latter at Burgh-on-Sands, he led the English army as far north as Cumnock, in Ayrshire, after which he returned to his own country. At home, E.'s conduct was contemptible. While still a youth, he had conceived an extraordinary admiration and fondness for a witty, clever, but dissolute creature called Piers Gaveston, the son of a Gascon knight. After he became king, there was no limit to the honours heaped on the favourite. When he went to France, in the beginning of 1308, to conclude a marriage with Isabella, daughter of Philippe V., king of France, Gaveston was left guardian of the kingdom.

The nobles were indignant, and demanded his banishment. Twice was Gaveston forced to leave England, but as often was he recalled by the weak monarch, whose love for him was sheer infatuation. At last the nobles rose in arms, besieged Gaveston in Scarborough Castle, and having forced him to surrender, hanged him at Warwick, 19th June 1312. Two years after this, E. invaded Scotland at the head of the greatest army ever collected in England—amounting, according to some historians, to 100,000 men. At Bannockburn, on the 24th June 1314, he was encountered by Robert Bruce (q. v.), and defeated with immense slaughter. This victory put Scotland and England on equal terms for all time coming, and made the notion of a military subjugation of the former country by the latter be given up. Finally, in 1319, after numerous petty successes on the part of the Scotch, E. concluded a truce with them for two years. He now exhibited again his imbecile passion for favourites. The person selected on this occasion was Hugh le Despencer. Once more the nobles rebelled, and both Hugh le Despencer and his father were banished in July 1321, but some months after, were recalled by E., and many of the nobles, among others, the Earl of Lancaster, were beheaded in the following year. Immediately after, E. invaded Scotland for the last time, and penetrated as far as Culross, in Fife; but having achieved no particular success, he concluded a truce with that nation for thirteen years, and returned to England. A dispute now arose between him and Charles IV. of France, brother of his wife Isabella, in regard to the territories which he held in that country. Charles seized them, whereupon E. sent over Isabella to remonstrate, and, if possible, to effect an amicable arrangement between them. Isabella, it would appear, despised her husband, and disliked the Despencers. Meeting at the French court many English nobles who, entertaining similar feelings, had left their country to avoid the enmity of the favourites, she was easily induced to make common cause with them against her husband and the Despencers. At the same time, she formed a connection of a criminal kind with Roger de Mortimer, one of the most powerful of the exiles. This of course more thoroughly involved her in the plot against Edward; and having obtained possession of the young Prince of Wales, afterwards Edward III., she embarked from Dort, in Holland, with a large body of malcontents, and landed at Orwell in Suffolk, 22d September 1326. The queen and the banished nobles were soon joined by all the influential persons in England. E. fled, but was taken prisoner at Neath Abbey, in Glamorganshire; the Despencers, father and son, were executed; and the monarch himself, after being formally deposed, 25th January 1327, was murdered in Berkeley Castle, 20th September of the same year. He left two sons and two daughters.

**EDWARD III.**, son of the preceding, was born at Windsor, 13th November 1312, and ascended the throne, 25th January 1327. During his minority, the country was governed nominally by a council of twelve nobles and bishops, but really by Mortimer and his paramour Isabella. On the 24th January 1328, the young king married Philippa, daughter of the Earl of Hainault; and two years after, resolving to take the power into his own hands, he seized Mortimer, and put him to death, 29th November 1330, and banished his mother, Isabella, to her house at Risings (where she lived for twenty-seven years). He next invaded Scotland, to assist Edward Baliol, son of John Baliol, who, in the confusion that ensued on the death of the great Bruce, had made a descent on the country, and got himself crowned at Scone. A bloody battle was fought at Halidon Hill, near Berwick, 19th July 1333, in which the Scots were completely defeated. Baliol now assumed the authority of a king, and did homage to E. for his possessions, the result of which act was, that he had to flee the kingdom in a few months, for the thing most intolerable to the Scottish spirit was that any monarch should dare, or fancy he had a right, to surrender the independence of his country. In the course of three years, E. thrice invaded Scotland; but though he frightfully wasted the country, and brought armies with him such as could not be successfully opposed, he could not break the invincible spirit of the people, who, after each invasion had rolled over them like a flood, rose and rallied with a still more stubborn and impassioned resolution to be free. But the scene of E.'s great exploits was France. Charles IV. having died without a son, Philippe of Valois, the nearest heir by the male line, ascended the throne, under the title of Philippe VI. E. claimed the crown in right of his mother Isabella, sister of Charles; but as the law of France expressly excluded females from enjoying sovereign rights, it is manifest that E.'s claim was utterly groundless. The English king admitted that his mother, being a female, could not inherit the crown of France, but affirmed that he, as her *son*, might. But it is clear that he could not receive from his mother rights to which she herself had no claim. Yet never was a bad cause ennobled with more splendid triumphs. E. declared war against Philippe in 1337. His first campaign was not very remarkable; but in 1346, accompanied by his eldest son, known as the Black Prince, he again invaded France, conquered a great part of Normandy, marched to the very gates of Paris, and on the 26th August 1346, inflicted a tremendous defeat on the French at Crécy (q. v.). Here the Black Prince, though only sixteen, exhibited the courage and the prowess of a veteran, slaying with his own hand the king of Bohemia, who fought on the side of France. After some further successes, such as the reduction of Calais, a truce was concluded between the two nations for several years. Meanwhile, the Scots had sustained a severe defeat at Neville's Cross, near Durham, their king (David) being taken prisoner. In 1356, the war with France was renewed, and on the 19th September of that year, the Black Prince obtained a brilliant victory at Poitiers, King John of France (Philippe having been dead for some years) falling into his hands. The Scotch monarch was released for a ransom of £100,000 in 1357, and King John in 1360, when a peace was concluded between the French and the English, by which the latter were to retain their conquests. King John, however, finding it not consistent with the honour or desire of his country that such a peace should be carried out, magnanimously returned to captivity, and died in London, 8th April 1364. Shortly before this date, David, king of Scotland, whose residence in England had extinguished the little patriotism he ever had, entered into a secret agreement with E., in virtue of which his kingdom—if he died without male issue—was to be handed over to the English sovereign. Meanwhile, the Black Prince, who had married Joanna, daughter of the Earl of Kent, had received from his father Aquitaine and Gascony, and ruled there for some time very prosperously; but ultimately involving himself and his father in a war with France, which was disastrous in its issues, he was obliged, in 1374, to conclude a truce for three years. E. waged war no more. In spite of his brilliant victories, in spite of the dazzling valour of his son, he was at the last unsuccessful. Neither in Scotland nor in France did he realise his desires. Affairs at home were no less unsatisfactory in the last years of his life. He quarrelled with his parliaments, and the Black Prince led the opposition. The latter, however, died 8th June 1376, in the 46th year of his age. E. himself expired on the 21st June 1377, after a reign of 51 years. By his wife, Philippa, he had seven sons and five daughters, several of whom died young. He was succeeded by his grandson Richard, son of the Black Prince, who ascended the throne as Richard II.—The reign of E. was marked by the great progress made in law—a greater number of 'important new laws being passed than in all the preceding reigns since the Conquest.' Among these laws were several indicating the increasing repugnance of Englishmen to ecclesiastical, and especially to papal jurisdiction. Trial by jury also now began to supersede other modes of trial. Justices of peace likewise make their earliest appearance in this reign, and legal proceedings were ordered to be carried on henceforth in English, and not in French. Sir James Mackintosh is of opinion, that though E.'s 'victories left few lasting acquisitions, yet they surrounded the name of his country with a lustre which produced strength and safety'—an opinion which appears, on the whole, to be well founded. It remains to be said that E.'s reign witnessed the culmination of chivalry, and in the Black Prince, possessed a splendid example of its virtues and its vices. The fine arts, especially architecture and poetry, also attained a grand development. Chaucer, Gower, and several eminent chroniclers, flourished at this time, and in the sphere of religious reform stands out the noble and thoroughly English figure of Wickliffe.

**EDWARD IV.**, son of Richard Duke of York, and great-grandson of Edmund Duke of York, who was the 5th son of Edward III., was born at Rouen, 29th April 1441 (or, according to another account, in September 1442). His original title was that of Earl of March. It would be quite impossible, in the short space at our disposal, to clear our way through the jungle of family relations by which Richard Duke of York, the father of Edward IV., traced his right to the throne. Suffice it to say, that in 1460 the bloody struggle between the *Yorkists* (the party headed by Richard Duke of York, who *at first* professed only a desire to remove from the king, Henry VI., his pernicious councillors) and the *Lancastrians* (the party of the sovereign) ceased for a moment. The Yorkists, on the whole, had been victorious on the battle-field, and their leader contrived to induce parliament to appoint him Henry's successor. Shortly after, however, Henry's wife—the brave Queen Margaret—raised an army in the north, and on the 31st December 1460, encountered and overthrew York on Wakefield Green, the duke himself being slain. But this reverse was compensated for by the success of his son Edward, who, after routing the royal or Lancastrian forces, under the Earls of Pembroke and Ormond, at Mortimer's Cross, near Hereford, marched towards London, which he entered on the 28th February 1461. He immediately presented his claim to the crown to parliament, which admitted its validity, and on the 4th of March ascended the throne as Edward IV., amid the acclamations of the citizens of London, with whom he was a great favourite. For three years he had to struggle hard to keep his position. His first victory over the Lancastrians was obtained at Towton, in Yorkshire, 29th March 1461, hardly one month after his accession. Finally, in May 1464, a few days after the victory at Hexham, Henry himself fell into E.'s hands. This closed the war for a time. About this time, E. married Elizabeth Woodville, widow of Sir Thomas Gray. This marriage gave great offence to the Earl of Warwick, by far the most powerful of E.'s adherents, who was at that time engaged in prosecuting an alliance between E. and the sister-in-law of Louis XI., king of France. In 1469, Warwick openly declared against him, joined Queen Margaret, and compelled E. to flee the country. King Henry was released from the Tower, where he had been a prisoner for six years, and once more invested with royal authority. But in the spring of 1471, E. landed at the Humber, proceeded swiftly to London, seized the person of Henry, and was again hailed king by the inhabitants. Warwick now gathered an army, and hurried to encounter him. The two met at Barnet, where Warwick was defeated and slain, April 1471. In the course of the next month, E. routed the Lancastrians at Tewkesbury, capturing both Queen Margaret and her son, Prince Edward. The latter was murdered the day after the battle; the queen, herself, after an imprisonment of four years, was ransomed by the French monarch. E. died 9th April 1483, the later years of his reign presenting few political incidents of any moment. E. was an able commander, as his numerous victories shew, but he was dissolute in the extreme. It was during his reign that printing was introduced into England, as also silk manufactures. In law, few notable changes occurred, but the practice of indirect pleading dates from this period, which is also illustrated with the names of distinguished legists, such as Littleton and Fortescue.

**EDWARD V.**, son of the preceding, was born 4th November 1470. The story of his life is brief and tragic. At the death of his father, he was living at Ludlow, in Shropshire, a boy of thirteen. When the news reached Ludlow, Earl Rivers, his uncle by the mother's side, set out with him for London. Richard Duke of Gloucester, however, contrived to obtain possession of his person at Northampton, and brought him to the capital himself, in the beginning of May 1483. Towards the end of the same month, Richard was appointed Protector of the kingdom. About the middle of June, the young Duke of York, brother of Edward V., also fell into his hands. The two hapless boys were then removed to the Tower, and were never more heard of. The general, and in all probability the correct opinion is, that they were murdered by command of Gloucester himself. All attempts to whitewash 'the bloody and devouring chief' have signally failed.

**EDWARD VI.**, son of Henry VIII. by his wife Jane Seymour, was born at Hampton Court, 12th October 1537. The events which happened during his brief reign were of great importance, but they were of course brought about by others, E. being too young (he was not sixteen when he died) to exercise any personal influence on the statesmen or the tendencies of his age. On the death of Henry in 1547, Edward Seymour, Earl of Hertford, became Protector of the kingdom. He was attached to the principles of the Reformation, and during his rule, great strides were made towards the establishment of Protestantism in England. The images were removed from the churches; refractory Roman Catholic bishops were imprisoned; the laity were allowed the cup at the ceremony of the Lord's Supper; all ecclesiastical processes were ordered to run in the king's name; Henry's famous six articles (known as the Bloody Statute) were repealed; a new service-book, compiled by Cranmer and Ridley, assisted by eleven other divines, was drawn up, and ordered to be used, and is known as the *First Prayer-book of Edward VI.* (see COMMON PRAYER BOOK); and the celibacy of the clergy ceased to be obligatory. In war, Seymour shewed himself to be a brave general. During the first year of his protectorate, he invaded Scotland, on account of the refusal of the Scottish government to fulfil the contract into which it had entered with Henry VIII., by which it was agreed that Mary Queen of Scots should marry Edward. The battle of Pinkie followed, on the 10th September 1547, in which the Scots were completely beaten; and Seymour, now Duke of Somerset, might have inflicted most serious damage on the whole country if his presence had not been required at home. He returned to find that his brother, Lord Seymour, had been caballing against him. Somerset had him arrested, tried, and condemned for treason, and on the 20th of March 1549, he was beheaded on Tower Hill. In the summer of the same year the Protector quelled an insurrection of the populace headed by one Kett, a tanner; but in the course of a few months, a more dangerous adversary appeared in the person of John Dudley, Earl of Warwick, whose party, by dint of insinuations against Somerset, excited the nation against him, and at last compelled the king to sign his deposition. On the 14th of October, Somerset was placed in the Tower; and on the 1st of December 1551, he was tried before the House of Lords for treason, condemned, and executed, 22d of January 1552. The people regretted, with good reason, his death, for Dudley was both a worse and a weaker man than himself. Before Somerset's execution, Dudley had been created Duke of Northumberland. He was himself (judging from his dying declaration) a Catholic, but he certainly took no means to re-establish the old religion. His great aim was to secure the succession to the throne of England for his family. With this view, he married his son, Lord Guildford Dudley, to Lady Jane Grey, daughter of the Duchess of Suffolk, to whom, by the will of Henry VIII., fell the crown, in default of issue by Edward, Mary, or Elizabeth. Northumberland now worked upon the weak and dying Edward to exclude Mary and Elizabeth, and nominate Lady Jane Grey as his successor. E. at last consented, and a document settling the succession on this lady was drawn up in June 1552. The king lived only a few weeks after, dying on the 6th of July. Subsequent events entirely frustrated Northumberland's design. King E., during his short reign, founded a great number of grammar-schools, which still exist, and are known as *King Edward's Schools.*

**EDWARDS**, Henri Milne. See Milne-Edwards, Henri.

**EDWARDS**, Jonathan, a celebrated American divine and metaphysician, was born at Windsor, in the state of Connecticut, 5th October 1703, entered Yale College in 1716, took his degree of B.A. in the following year, and in 1722 was licensed to preach the gospel. Towards the close of 1723, he was appointed tutor of Yale College, an office which he filled with distinguished success. In 1726, he accepted an invitation to become colleague to his maternal grandfather, Mr Stoddard, in a church at Northampton, and was ordained in February 1727. Here he laboured with intense zeal for more than twenty-three years, at the end of which period he was dismissed by his congregation. The immediate cause of the rupture between him and his hearers, was his insisting that no 'unconverted' persons should be allowed to approach the Lord's Table; but some years before, he had alienated the regards of a large number of the influential members of the church by denouncing the reading and circulation of certain books which were immoral and injurious, and by attempting to make a public example of the offenders. E. was a powerful and impressive preacher, sombre and even gloomy in his religious opinions and sentiments, but earnest, unaffected, and nobly conscientious. During the famous 'Revival' of 1740—1741, he was much sought after as a preacher, and is in fact often regarded as the originator of that movement. Certain it is that as early as 1734, a local manifestation of religious enthusiasm had taken place in his own parish, of which he published an account, entitled *A Faithful Narrative of the Surprising Work of God, in the Conversion of many Hundred Souls in Northampton.* The quarrel between E. and his congregation shews, however, that the 'revival' had not exercised any very strong influence on the community in general, since only a few years elapsed between the ecstasies of devotion and the circulation of obscenity. After his dismissal in 1750, E. became a missionary among the Indians of Massachusetts. While residing at Stockbridge in that state, he composed his famous treatises on the *Freedom of the Will* and *Original Sin.* In 1757, he was chosen president of Princeton College, New Jersey, whither he proceeded in January 1758, but was cut off by small-pox on the 22d of March in the same year.—E. will always be considered a master in dogmatic theology. Calvinism had probably never so powerful a defender. According to the late Robert Hall, 'he ranks with the brightest luminaries of the Christian Church, not excluding any country or any age since the apostolic.' His great characteristics are depth and comprehensiveness of argument; and were it not that the age for such discussions as E. loved is gone by, few writings would be more worthy of patient study than those of this illustrious divine. Besides the works already mentioned, E. wrote a *Treatise concerning Religious Affections*, the *History of Redemption*, a *Dissertation concerning the End for which God created the World*, and a *Dissertation concerning the True Nature of Christian Virtue.* The last three were posthumously published. A complete edition of E.'s works was published by Dr Timothy Dwight in ten vols. (1809), and another at London in 1817. A third was published in 1840, containing an essay by Henry Rogers, and a memoir by Sereno E. Dwight.—Jonathan Edwards, D.D. (born 1745, died 1801), the son of the preceding, was a person of similar character to his father, and, curiously enough, experienced similar vicissitudes of fortune. Both were tutors in the seminaries in which they were educated; were dismissed on account of their religious opinions; were settled again in retired situations; were elected to the presidentship of a college; and in a short time after they were inaugurated, died at nearly the same age. The younger Edwards was also a writer of sermons and theological treatises.

**E'DWIN**, an English Saxon prince, was the son of Ella, king of Northumbria, who died about 589. He succeeded to the throne at the age of three years, but a neighbouring potentate, Ethelfrith, invaded and conquered his territories, whereupon the infant E. was carried into North Wales, and was there educated. When he grew up to man's estate, Ethelfrith, fearing that his power would not be secure so long as E. lived, forced him from his asylum, and for many years he wandered about a disguised fugitive. Reaching East Anglia, he claimed the protection of King Redwald, which was readily granted. While residing there, Ethelfrith sent messengers to Redwald, requiring him to deliver E. into his hands, and threatening war in the event of a refusal. Redwald promised to accede to the request. A friend made known the resolve to the prince, and counselled flight; to this E. would not consent, but sat down without the palace, brooding over his misfortunes. While sitting there, Bede states that an unknown person approached him, and promised release from all his sufferings, if he would listen to what should be afterwards taught him. The apparition then placed its hand upon his head, and, bidding him remember the interview and the sign, disappeared.

Redwald's queen pleaded the cause of E., and he finally determined to protect him. Raising an army, Redwald surprised Ethelfrith on the Idel, in Nottinghamshire, and defeated and slew him in 617. When E. regained his kingdom, he wooed Edilberga, daughter of Ethelbert of Kent. Her brother, who was a Christian, objected to her alliance with an idolater; but E. promised that he would not interfere with her religious belief. The princess became his wife; and Paulinus, who had been sent by Gregory to assist Augustine in his mission, accompanied her as her bishop.

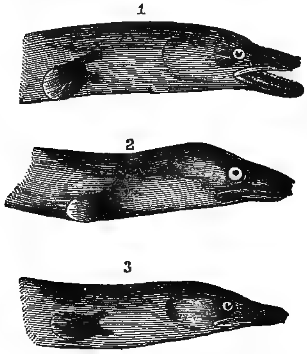
About this time, E.'s life was attempted by an assassin, sent by the king of Wessex. He escaped with a slight wound, and on the same night the queen was delivered of a daughter. The king thanked his idols for the birth, but Paulinus directed his thankfulness to the Christian Saviour. The king promised to accept the new faith, if Heaven would grant him victory over the king of Wessex. His child and eleven of his household then received the rite of baptism. Raising an army, he defeated his foe, but delayed to fulfil his promise. Paulinus, having heard of the apparition which appeared to him while residing at the court of Redwald, one day entered the apartment in which E. sat, and placing his hand upon his head, asked him if he remembered the sign. The king was visibly affected, and at once assembled his Witenagemôte to deliberate on the matter of the new religion. Coifi, the high priest, spoke first, and intimated his willingness to desert the idols, and embrace the Christian faith. A thane next rose and pronounced the beautiful speech which has been versified by so many poets, but which is most effective in the simple serious Saxon of the chroniclers. Coifi then headed the people in destroying the idol temple.

E. and the nobility of his kingdom were baptized in the eleventh year of his reign. Thereafter, he became the most powerful prince in England. He subdued a part of Wales, and his power extended northward to the Lothians. In 634, he fell in battle at Hatfield Chase, in Yorkshire; and in that disastrous fight, one of his children, and the greater portion of his army, perished. The history of this prince has been made the subject of a beautiful poem (*Edwin of Deira*, 1861) by Alexander Smith.

**EECLOO′**, a town of Belgium, in the province of East Flanders, stands on the high road between Ghent and Bruges, and is 12 miles north-west from the former. It is clean and well built; and has manufactures of woollens, cottons, hats, tobacco, chocolate, soap, &c.; also breweries, distilleries, vinegar-works, salt-refineries, dye-works, oil-mills, and a thriving trade in linen, cattle, and timber, as well as in grain, for which it has a large weekly market. Pop. 9300.

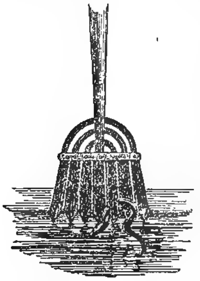
**EEL**, a name popularly given to all serpent-shaped or worm-shaped fishes, and sometimes extended to other animals of similar form, but otherwise extremely different, as the *eels* in paste, in vinegar, &c. The fishes to which this name is most commonly applied are *malacopterous* fishes destitute of ventral fins, and having the body covered by a soft thick slimy skin, the scales very minute, and often almost invisible, or entirely wanting. Most of them were included in the Linnæan genus *Muræna*, and now constitute the family *Murænidæ*, divided by some naturalists into the families *Synbranchidæ*, *Murænidæ*, *Anguillidæ*, *Congeridæ*, and *Ophisuridæ*. All these have the skeleton destitute of ribs, and the fin-rays not jointed; whilst the *Gymnotidæ*, including the Electric Eels (see Gymnotus), have ribs encompassing the belly, and the fin-rays jointed or branched. In all the eels, the gill-orifices are very small, and are situated far back, so that there is a long passage from the gill-chamber outwards; and hence, the gills not soon becoming dry, these fishes can remain out of water for a considerable time without injury, and some of them occasionally leave it of their own accord. The smallness of the gill-opening is also regarded as probably indicative of feebleness of respiration; and this, as in reptiles, is connected with extreme tenacity of life.—The *Synbranchidæ* have the gill-passages so united under a common integument, as to present externally only a single orifice. They are almost destitute of fins. The species are few, and found only in tropical and subtropical seas.—The *Murænidæ* are also generally destitute of fins, or nearly so; they are all destitute of scales. They are all marine.—The *Anguillidæ*, on the contrary, are fresh-water fishes, although some of them occasionally visit the sea. They have pretty large pectoral fins, anal and dorsal fins extending to and encompassing the tip of the tail, and numerous longish scales imbedded in groups in the skin, so as to resemble lattice-work. To these the Congers (q. v.), although marine, are very nearly allied. The *Ophisuridæ*, or Snake-eels (q. v.), of the Mediterranean and other seas, are more widely different, and are easily distinguished by the tail ending in a conical finless point.

Until recently, all the British fresh-water eels were confounded together as of one species (*Anguilla vulgaris*): Mr Yarrell was the first accurately to distinguish them, and to shew that there are at least three, if not four species, differing considerably in form, and in anatomical characters, as the number and form of the vertebræ, &c. Two of these seem to be very generally diffused, the Sharp-nosed E. (*A. acutirostris* or *A. vulgaris*) and the Broad-nosed E. (*A. latirostris*). The difference in the form of the snout, which these names indicate, is very marked and obvious, and the general form of the sharp-nosed E. is also more slender.—The Snig E. (*A. mediorostris*), found in some of the English rivers, is intermediate in the form of its snout, and is considered superior to the other kinds for the table. Its cervical vertebræ are destitute of the spinous processes which are found in both the other species. It is comparatively small. The sharp-nosed E. seems to attain the greatest size, sometimes almost



Heads of Eels:
1, The Snig (*Anguilla mediorostris*); 2, Broad-nosed Eel (*Anguilla latirostris*); 3, The Grig (*Anguilla Platbec*).

thirty pounds-weight. It migrates on the approach of winter to the warmer brackish water of estuaries, often entering water which is perfectly salt; or if migration is impossible, it buries itself in mud. Eels are taken in great numbers during winter by means of *eel-spears*, or forks with several prongs, plunged into the mud. Sometimes they are digged out of the mud of river-banks, where large numbers are found congregated together. The eels which descend to estuaries or to the sea deposit their spawn there, and countless multitudes of young eels ascend rivers in spring. The passage of the young eels is called on the Thames the *eel-fare*, from a Saxon word signifying to pass or travel. So strong is the instinct which impels them, that they surmount obstacles apparently far more than sufficient to arrest their progress; they have been seen to ascend the large posts of floodgates, 'those which die, stick to the posts; others, which get a little higher, meet with the same fate, until at last a sufficient layer of them is formed to enable the rest to overcome the difficulty of the passage.' Young eels have also sometimes been met with in large numbers performing migrations on land among moist grass, generally in the evening or during the night; but the purpose of these migrations is not very well understood, nor are they known to take place with regularity.—Those eels which cannot migrate to the sea, breed in inland rivers and lakes.

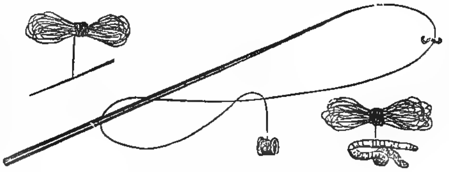


Eel-spear.

Eels are very averse to cold, and to this is ascribed their winter descent to brackish water, or hiding of themselves in mud. The number of known species is large, but they all belong to the temperate and warmer regions of the globe. In these also, the marine fishes to which the name E. is sometimes extended, chiefly abound.

There is a prejudice in some countries—particularly in Scotland—against eating eels, on account of their serpent-like appearance; but generally, as in England, they are highly esteemed. The London market is very largely supplied with eels from Holland; they are sent over alive in welled vessels.

There are various means besides those already noticed employed for the capture of the eel. Weirs and stages are erected across rivers, and baskets, or *bucks*, as they are termed, fixed in them for the taking of the eels during their migrations. These baskets are of large size, and shaped like a huge Chinese jar, in the mouth of which is fitted a sort of funnel-shaped mouse-trap entrance, composed of flexible withy rods coming inwards to a point, and through which the eels can easily force their way; but when they turn about to find the entrance again, it is closed against them. When the eels are running, as it is termed—that is, during their migrations—many hundredweights are often taken in these basket-traps in a single night. *Eel-pots* are also used for their capture. These are of a similar nature to the bucks, but are smaller and more slender. They are sunk, by means of bricks tied to them, in the most likely runs or narrow spaces between weeds, or close to banks, and through which eels are likely to run. After a thunderstorm, eels always run well, as it disturbs them greatly. Eels are also caught by means of night-lines. These are long lines with heavy weights at each end, and in the middle if necessary, with hooks tied on every yard. These hooks are baited with pieces of dead fish, minnows, or worms. The line is sunk, and laid across stream—or, if fishing for conger-eels, in the sea—with, if it be thought necessary, a small buoy at one end, to recover the line by. These eel-lines should be hauled as early in the morning as possible, or the best eels will be found to have worked themselves off, leaving a mass of knots and slime behind them, to shew where they have been. *Sniggling* is a favourite amusement with some anglers. A rod or a long stick is provided, bent round at the slender end like the top of a very well used fishing-rod; on the point is fixed a single ring; through this ring is passed a piece of string; one end of this is held in the fisherman's hand. To the other end, on some fine but strong cord, is fastened a stout darning-needle, tied to the cord by the middle. The needle is then baited, or thrust lengthwise into a large lob-worm, until the fine cord alone comes out of the head of the worm. The worm is then drawn up to the ring of the rod. The fisherman then seeks for some hole in which he thinks an eel may be, and applying the point of the rod, pushes the worm into it. As soon as the fisherman believes an eel has swallowed the bait, he gives a slight pull to the string; and the needle, which has gone down the eel's throat inside the worm perfectly straight, being tied by the middle, turns crosswise in the eel's throat or stomach, and hooks him. *Clod-fishing* is thus practised: a quantity of lob-worms are strung by means of a needle on to some stout worsted until a considerable bunch of them is obtained; this is tied to the end of a cord, which is again tied to a stout pole. When the eels are on the move, the fisherman takes his station with a pail half-full of water within reach; he then drops his clod into the water, and allows it to sink to the bottom. As soon as he feels an eel tugging at it, he steadily and quickly, but without jerk, raises the bait from the water. The eel frequently has its teeth so entangled in the worsted as to be unable to let go, and thus is lifted from the water. The bait is held over the pail, a shake or two dislodges the eel, and the clod is then dropped into the water again, to fish for more. Sometimes two or even three eels come up at once, and a great number are often taken thus.



Eel Sniggling Apparatus.*

**EEL-POUT**, a name given in some parts of England to the burbot, and on some parts of the Scottish coast to the viviparous blenny.

**EELS** in paste, vinegar, &c., are animalcules (*Infusoria*) of the family *Vibrionidæ*. When at rest, they appear like very minute hairs, or bits of very fine thread. Some of them wind themselves about in a spiral form when they move. The species are numerous, and they occur in almost all vegetable substances beginning to corrupt and undergo decay, which they hasten. They are found also in decaying animal matter, and have recently been detected in diseased animal tissues; but the species found in such situations have not the elongated form which has given the name eels to those inhabiting paste a few days old, stale vinegar, &c., or occurring in diseased parts of living vegetables. Whether or not the origination of disease is to be ascribed to their presence in animal tissues, is not yet well ascertained; but in living vegetables, this appears to be certainly the case, particularly in the disease of wheat called Ear-cockles (q. v.).

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* The above figures are taken from Blaine's *Encyclopædia of Rural Sports*. Longmans, London. In this excellent work there is a very full description of the various methods of fishing for eels.

**EFAT.** See Shoa, Abyssinia.

**EFFARÉ**, or **EFFRAYÉ** (Fr.), in Heraldry, signifies that the animal to which it refers is to be represented as rearing on its hind-legs, as if it were frightened or enraged.

**EFFE'CT.** The general impression produced on the mind by the first sight of a picture or other work of art, or the impression which it produces when seen from so great a distance as to render the details invisible. The term has reference both to design and colouring, both of which, if correctly indicated, may be judged of with perfect confidence before either has been completed in detail. Bold sketches of their works are generally made by careful artists beforehand, for the purpose of adjusting the composition and colouring so as to produce the desired effect.

**EFFE'NDI**, a title of honour among the Turks, bestowed upon civil dignitaries and persons of various ranks, in contradistinction to the title of Aga, borne by courtiers and military men. The word is equivalent to the English Sir, or the French Monsieur, and is frequently added to the name of an office. Thus, the sultan's first physician is termed *Hakim-effendi;* the priest in the seraglio, *Imam-effendi;* and the Minister of Foreign Affairs, *Reïs-effendi*, &c.

**EFFERVESCING DRAUGHTS.** See Aërated Waters.

**E'FFIGY** (Lat. *effigies*), a likeness or representation either of the whole figure or of the head and face, as on a coin. See Brass, Monumental. It is scarcely an artistic word.

**EFFLORE'SCENCE** is the term applied to the appearance of a white incrustation on the walls of buildings, or when a salt loses its water of crystallisation, and presents a white powdery appearance on the surface. Common washing-soda exposed to the air affords a good illustration of this phenomenon.

**EFFRAYÉ.** See Effaré.

**EFT**, a term of Anglo-Saxon origin, applied both to lizards and newts, which—notwithstanding the important differences between them—were until recently confounded even by naturalists. The Scotch word *ask* seems to be the exact equivalent of the English *eft.* In works of natural history, the term eft is now used as synonymous with Newt (q. v.).

**E'GBERT**, the most celebrated of the Anglo-Saxon kings before Alfred, was the son of Alckmund, who is said to have reigned in Kent, and was a descendant of the House of Cerdic. In 787, on the death of Cynewulf, king of Wessex, E. laid claim to the throne, but had to give way to another claimant, Brihtric, who was the more powerful of the two. E. was compelled to flee, and took refuge at the court of Charlemagne. Here he remained for thirteen years, until, in 800, on the death of Brihtric, he was summoned to England to fill the throne of Wessex. England was at this time divided into three great sovereignties: Northumbria, extending over what were occasionally the separate kingdoms of Deira and Bernicia; Mercia, which had now subjugated the petty powers of Kent, Essex, and East Anglia; and Wessex, which had absorbed Sussex. For the first nine years of his reign, E. drew no sword. His mild government completed the attachment of his subjects, and the peace which he maintained fostered his strength. In 809, however, he marched against the Britons of the west, and after fighting five years in Cornwall and Devon, he succeeded in subduing the wild tribes to at least a temporary subjection. In 823, the most important event in his career took place. At that time a dispute had arisen between the East Angles and their Mercian conquerors, and the former sent ambassadors to E. imploring aid and protection. E. joined the East Angles with an army which, according to the old chroniclers, had a peculiarly fighting appearance, being 'lean, meagre, pale, and long-breathed.' The encounter between the Mercians and the East Angles with their ally took place at Ellandûn (the modern Wilton, according to some), where a furious battle was fought, in which the Mercians were defeated with great slaughter. By this battle the power of Mercia was broken, and Essex and Kent, formerly Mercian provinces, became incorporated with Wessex. For four years after the great battle of Ellandûn, Mercia remained the seat of discontent and strife, and E., in 827, taking advantage of his opportunity, led thither an invading force, and reduced the country to a state of vassalage. Turning next his arms against Northumbria, he compelled that sovereignty also to acknowledge his supremacy (827—828). He afterwards penetrated into Wales, where, in like manner, success attended his arms.

E., now virtually king of England, though both he and his successors until the time of Alfred were in the habit of designating themselves only kings of Wessex, found it necessary, after a few years' comparatively peaceful rule, to direct his attention to a new and foreign enemy. The Danes, who had been making frequent descents upon the island since 832, and who in that year had defeated the forces of E., reappeared in 835 on the coast of Cornwall, where they were joined by numbers of the Cornish Britons. E., however, at the head of his West Saxons, met them at Hengestes-dûn (Hengstone), and in a great battle completely overthrew them. In the following year, he died, after a reign of 37 years.—In E., ambition and prudence, bravery, talent, and courtesy were blended in such a manner as to form a monarch not unworthy to be the first king of England.

**E'GEDE'**, Hans, was born in Norland, in Norway, January 31, 1681, studied in Copenhagen, and was appointed to the church of Vaagen in Norway in 1707. Having determined to proceed to Greenland to convert the natives, he resigned his *cure* at the end of ten years; and, after devoting himself with assiduity to the study of the language, embarked for Greenland, with his wife and sons, in 1721. He remained fifteen years in Greenland, during which time he laboured zealously among the people, and by his preaching and teaching secured a permanent footing there for the Christian mission, which owed its origin to him. On his return to Copenhagen, he employed himself in instructing missionaries in the dialects of Greenland; and in 1740 he was made a bishop. He died in 1758. He has described the course and success of his labours in *Det gamle Grönland's nye Perlustration* (Copenh. 1729 and 1741). He was ably seconded in his labours by his wife and his sons, Povel and Niels.—Povel Egede, who was his father's successor in Greenland, and was also a bishop, translated the gospels and several devotional works into the Greenland language, and compiled a grammar and dictionary for the use of the Greenland mission; the latter appeared in 1750 under the title *Dictionarium Grönlandico-danico-latinum.*

**E'GER**, a town and river of Austria, in the province of Bohemia.—1. The town E. stands on a rock on the right bank of the stream of the same name, is 90 miles west of Prague, and near the Bohemian frontier. Formerly, it was a border fortress of some importance; its walls, however, have been almost entirely pulled down, and its fosses filled up with rubbish. Among the conspicuous edifices of E. are its churches, of which there are seven—one of them, the deanery church, very handsome; the market-place, within which is the large town-hall; two monasteries, a Dominican and a Franciscan; and the barracks. East of the market-place is the house of the burgomaster in which Wallenstein was assassinated in 1634. The ruins of the imperial burg or citadel, formerly the residence of kings and emperors, is situated in an angle of the fortifications above the river. From the midst of these ruins rises a singular square black tower, constructed of masses of volcanic tufa. The Double Chapel, consisting of two stories, the upper supported by graceful marble pillars, is a fine specimen of Gothic architecture. An avenue, nearly three miles long, leads from E. to Franzenbrunn (q. v.). E. has manufactures of broadcloth, kerseymeres, cottons, chintz, leather, soap, &c. Pop. about 10,000. —2. The river E. rises twelve miles north-west of the town of E., flows first south-east to E., then advances in a general north-eastern direction, passing Elbogen, Saaz, Birdin, and Theresienstadt, near which town it joins the Elbe, after a course, including windings, of about 120 miles. Its current is rapid, its banks high, its bed stony, and no part of its course is navigable.

**EGE'RIA** was the name of the Nymph or Camena from whom, according to the legend, King Numa received the ritual of public worship which he established in Rome. The grove where Numa met the goddess to receive her instructions was dedicated by him to the Camenæ. Roman legends speak of two groves dedicated to E.—one near Aricia, the other before the Porta Capena at Rome, where the grotto of E. is still shewn.

**EGG, or EIGG**, an island 12 miles off the west coast of Inverness-shire, and 8 miles south-west of the south point of Skye. It is 4½ miles long by 2½ broad. It consists chiefly of trap, which in the north alternates with sandstone and limestone, the latter rocks containing oolitic fossils, carbonised wood, and coal. The Scuir of Egg, in the south-west, rises 1339 feet. The upper 470 feet of this hill is a mass or vein of pitchstone, 1¼ mile long, and 100 feet broad. Some of the pitchstone forms straight, inclined, or curved columns, from a few inches to nearly two feet in diameter. In one place, the pitchstone overlies red sandstone, conglomerate, trap, and the silicified wood of an oolitic pine. In the south part of the isle is a large cave, entered by a narrow opening, through which only one person can creep at a time. Here it is traditionally related that the Laird of Macleod, to revenge an injury done to some of his clan, smoked to death all the inhabitants (200 Macdonalds) of the isle, who had hid themselves in the cave.

**EGG** (*ovum*). In a great majority of the different kinds of animals, reproduction takes place by means of eggs; in other words, the animals are *oviparous.* It is only in the *Mammalia* that we find animals truly viviparous; whilst the *marsupial* quadrupeds and the *monotremata* form connecting links, in this part of their natural history, between the mammalia which are viviparous in the fullest sense of the term, and the warm-blooded animals (birds) which are oviparous.

To the articles Reproduction and Development of the Embryo, we must refer for an exhibition of the differences between oviparous and viviparous reproduction, and of that original and essential agreement in important particulars, which has been strongly asserted in the saying, *Omne animal ex ovo* (Every animal is produced from an egg). To the article Development of the Embryo also reference must be made for what may be called the *history* of the egg, and the development and uses of its several parts.

The number of eggs varies extremely in different animals, some birds producing only one at a time, or in a year, others twenty or nearly so, whilst the roe of the herring, salmon, and many other fishes, contains myriads of eggs. The eggs of some animals are enveloped in a gelatinous mass; those of some are joined together, and are laid in a kind of string; those of others are connected together in various ways. For notice of such peculiarities, we must refer to the articles on different classes of animals.

The economical uses of eggs are well known. The eggs chiefly used are those of birds, although the eggs of turtles are also in great repute as an article of food and luxury, and those of fresh-water tortoises are valued for the oil which they yield. The birds' eggs chiefly used for food are those of the species commonly domesticated as poultry, and others allied to them—gallinaceous birds and web-footed birds. Of gallinaceous birds, the common domestic fowl, the turkey, the peahen, and the guinea-fowl, produce the eggs most generally used and brought to market in different parts of the world; of web-footed birds, the common duck is in this respect the most important, although the eggs of other *Anatidæ* are also used for food, and those of some of the other web-footed marine-birds are much sought after by the inhabitants of the wild and rocky shores which they frequent. Thus, the eggs of gulls and guillemots afford an important article of food to the people of St Kilda, and of some of the Orkney and Shetland Islands, as well as to the inhabitants of Iceland and other far northern regions. It is in quest of eggs, as well as of young birds, that the dangers of the most tremendous precipices are braved by men whom their companions let down by ropes, and who gather the eggs from the rock ledges. The coasts of Labrador are also visited by *eggers*, who collect the eggs of sea-birds, and carry them for sale to some of the American ports. The eggs of some of the sea-birds of the West Indies are of considerable commercial importance. See Egg-bird.

**EGG, Chemistry of.** An ordinary good-sized hen's egg weighs about 1000 grains, of which the white constitutes 600 grains, the yolk 300, and the shell 100. The white or glaire of the egg is a strong solution of Albumen (q. v.) in water, and whilst readily miscible with water in its ordinary state, it becomes insoluble when subjected to heat, as in boiling an egg. In 100 parts, the white or glaire of egg consists of—water, 80; dry albumen, 15½; salts, &c., 4½. The yolk or yelk of the egg is composed of a strong solution of albumen, through which multitudes of minute globules of oil are suspended, which render it essentially an emulsion. In 100 parts, it consists of—water, 53¾; dry albumen, 17½; oil (with small proportion of salts), 28¾.

**EGG, Mundane.** See Mundane Egg.

**EGG TRADE.** English poultry does not supply eggs in sufficient quantity to meet the home-demand, on account partly of the large consumption in manufactures. The deficiency is made up by importations, chiefly from France. There are no means of ascertaining the number of eggs produced by English poultry in the course of a year; but the importations are recorded in parliamentary papers. These importations have largely increased within the last few years. In 1844, they amounted to about 67 millions; in 1860, to nearly 160 millions. Eggs were, until recently, estimated for custom-house purposes by the cubic foot; and in 1859, out of 740,000 cubic feet imported, 650,000 were from France, and the rest principally from Belgium. The computed real value of this total was set down at £336,000, being about 9*s.* per cubic foot of about 200 eggs. The imported eggs are seldom equal in quality to those home-produced; they are often packed in damp straw, the odour from which penetrates the shell, and imparts an unpleasant flavour to the egg. There is a certain warmth in new-laid or good eggs, which tends to ferment the damp straw, or other substance in which they are packed, and this fermentation re-acts upon the eggs in the way stated. Until the recent removal of the duty, imported eggs paid 4*d.* per cubic foot if from British possessions, and 8*d.* if from foreign countries.

**E'GGA**, a large town of Western Africa, Yaruba country, is situated on the right bank of the Niger, in lat. 8° 43′ N., long. 6° 20′ E. It is said to be two miles long. Its streets are narrow; the houses are principally huts built of clay, the walls smooth, and stained with indigo. Great quantities of narrow cotton cloth, only a few inches in breadth, and generally dyed blue, are manufactured here. The inhabitants are enterprising and commercial, many of them possess canoes, in which they trade up and down the Niger. These canoes are covered by a sort of shed, under which the traders sleep at night. The chief articles of trade are beautifully carved calabashes, cloth net-work, corn, yams, sweet potatoes, dried fish, and a few European articles, as beads and gunpowder. The population, which is said to be immense, is partly Mohammedan and partly pagan.

**E'GGAR MOTH**, the name of certain species of moth, of the genus *Lasiocampa*, allied to the silk-worm moths. One species (*L. trifolii*), of a uniform foxy ochreous colour, with wings expanding about two inches, produces a caterpillar as thick as a swan's quill, hairy, and ochreous brown, which feeds sometimes on broom, but frequently in clover-fields.

Eggar Moth and Caterpillar (*Lasiocampa trifolii*).

**EGG-BIRD** (*Hydrochelidon fuliginosum* or *Sterna fuliginosa*), a bird of the gull family, sometimes called the SOOTY TERN. It is fully larger than the common tern of the British shores; has a long, slender, nearly straight, compressed, sharp bill; very long, narrow, and pointed wings, and a long deeply forked tail; the general colour is glossy black on the upper parts, except the forehead and the edges of the wings, which, with the under parts, are white. It abounds in the West Indian seas, and is to be seen in myriads on and near some of the *keys* or low barren islets where it breeds. When visitors land on these keys, the disturbed birds rise and fly about in clouds which darken the air, whilst their turmoil overpowers even the roar of the breakers. The nest of the E. is merely a little excavation in the sand, and usually contains three eggs, which are fully two inches long, of a pale-cream colour, sparingly marked with light-brown and purple tints. The eggs are esteemed delicious, and form an object of profitable adventure in the months of March, April, and May, to the crews of numerous small vessels, fitted out from Kingston, Havannah, and other West Indian ports. Curious customs prevail among the egg-gatherers at the most frequented keys, and common consent has established a kind of code of laws among them. The eggs remain fresh and fit for use only for a short time. Along with the eggs of the E., those of the Noddy are also gathered, and those of the Sandwich Tern and other allied species; and the name egg-bird, with some prefix, is sometimes extended in the West Indies to several of the terns.

Egg-Bird, or Sooty Tern (*Hydrochelidon fuliginosum*).

**EGG-PLANT** (*Solanum melongena*), an annual usually less than two feet high, with stem partially woody; fruit very much resembling an egg in

Egg-plant (*Solanum*):
A, purple variety; B, white variety.

appearance, and varying in size from that of a hen's egg to that of a swan's egg, in colour generally white, yellow, or violet. The fruit is much used as food, not only in the East Indies, of which the plant is a native, but in warm countries generally, into which it has been introduced, its cultivation extending to comparatively northern regions which have a warm though not long summer. In Britain, the E. is scarcely to be seen except in hothouses. The fruit is known by various names—as Egg-apple, Auberjine, Brinjal, &c. It is also sometimes called Mad Apple and Jews' Apple, names probably transferred to it from the poisonous Apple of Sodom (*Solanum Sodomeum*).

**E'GHAM**, a village in the north-west of Surrey, on the left bank of the Thames, 18 miles west of London. In the vicinity is Runnymede, a meadow on the Thames, where King John conferred with his barons before signing the Magna Charta in 1215. Near also is Cooper's Hill, rendered famous by Denham and Pope.

**E'GINHARD**, or **EI'NHARD**, the biographer of Charlemagne, was born towards the end of the reign of Pipin, or the beginning of that of Charlemagne. At an early age, he repaired to the court of the latter monarch, and became a pupil of Alcuin. His talents and acquirements gained him the favour of the emperor, who appointed him his private secretary, and superintendent of public buildings. E. accompanied the emperor in all his marches and journeys, never separating from him except on one occasion, when he was despatched by Charlemagne on a mission to Pope Leo. On the death of the emperor, he was appointed preceptor to Lothaire, son of Louis le Débonnaire, and for a number of years afterwards appears to have been lay abbot of various monasteries; but ultimately becoming tired of secular life, he retired to the secluded town of Mühlheim. Here he erected a monastery, and changed the name of the place from Mühlheim to Seligenstadt (City of the Blessed). He now agreed with his wife to consider her only as a sister, and became a monk. E. died 25th July 844, and was buried beside his wife, who died in 839. The two coffins are now shewn in the chapel of the castle at Erbach. The counts of Erbach trace their descent from Eginhard. His *Vita Caroli Magni*, completed about the year 820, with respect to plan and execution, as well as language and style, is incontestably the most important historical work of a biographical character that has come down to us from the middle ages. It was frequently used as a school-book, and was therefore copied *ad infinitum*. The best German edition is that of Pertz, in the *Monumenta Germaniæ Historica*. His *Epistolæ*, 62 in number, are also of considerable value in a historical point of view. The French consider the edition of E.'s works by M. Teulet, with a translation, and life of E. (1848), to be the best and most complete. E.'s second work, the *Annales Regum Francorum, Pippini, Caroli Magni, Hludowici Imperatoris*, embraces the period from 741 to 829. According to a pretty legend, E.'s wife, Emma, was a daughter of Charlemagne. A mutual affection had arisen between them, and on one occasion when the lovers were enjoying a nightly interview, a sudden fall of snow covered the spacious court, thus rendering retreat impossible without leading to a discovery. As the traces of female footsteps could not excite suspicion, Emma carried her lover across the court on her shoulders. This scene, it is said, was observed from a window by Charlemagne, who united the affectionate pair in marriage. On this legend Fouqué has founded his romance of *Eginhard and Emma*.

**E'GLANTINE**, a name sometimes given to the Sweet Brier (*Rosa rubiginosa*), but also sometimes to other of the smaller-flowered species of rose.

**EGLINTON**, EARL OF. See MONTGOMERIE.

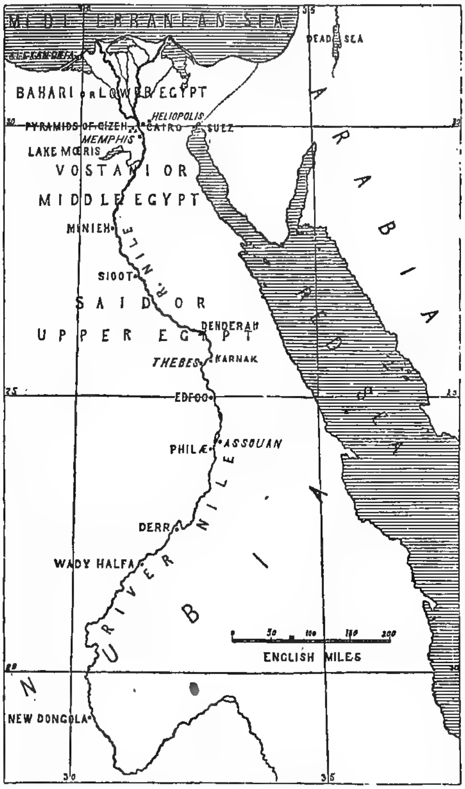
**E'GMONT**, besides indicating several other places of inferior interest, designates the principal harbour of the Falkland Islands, and also an active volcano in New Zealand.—1. Port E. is formed on the north coast of the more westerly of the principal two islands of the group, its seaward barriers being the islets of Keppel and Saunders. It is in lat. 51° 21′ S., and long. 60° W. The anchorage is good; and the shores afford fresh water, but are almost destitute of wood.—2. Mount E. is on the northerly island of its own group, rising 8840 feet above the sea. It is 18 miles to the south of New Plymouth, in lat. 39° 15′ S., and long. 174° 13′ E.

**EGMONT**, LAMORAL, COUNT, PRINCE OF GAVRE, was born in the castle of La Hamaide, in Hainault, in 1522; and inherited his property and titles from his elder brother Charles. He accompanied Charles V. on his expedition against Algiers in 1541, and followed that monarch afterwards in all his campaigns, but without distinguishing himself greatly. After the accession of Philip to the throne, E. commanded, with great success, the cavalry, in the battle of St Quentin, 1557, and next year in that of Gravelines; and when Philip finally returned to Spain, he left E. governor of Flanders and Artois. In this position, E. entered into alliance with the party in the Netherlands that were dissatisfied with the Catholic policy of Philip, and from a courtier became all at once a man of the people. His proud, imperious character, however, and his subsequent conduct, have induced many to suppose that, like his bosom-friend the Prince of Orange, he was less actuated in this by high motives than by self-interest, or at least by disappointed ambition. The more common opinion, however, is, that he was a humane and virtuous patriot, who, although indifferent to Protestantism as a religion, was anxious to do justice to all the members of that oppressed faith. When Margaret, Duchess of Parma, against the will of the Protestant party, was made regent-general of the Netherlands, E. and the Prince of Orange entered the council of state, and held the command of the few Spanish troops. At first he sided with the party who were discontented with the infringement of the liberties of the provinces, and the introduction of the inquisition; but when insurrections broke out, he at last broke with the Prince of Orange and the 'Beggars' League,' as it was called. He seemed to have restored order, and to be maintaining it, when, in April 1567, the Duke of Alba was sent as lieutenant-general to the Netherlands. The Prince of Orange and other chiefs of the insurrection left the country; E., wishing to save his private property, remained, thinking his return to the court had secured his safety. When Alba entered Brussels, 22d August, E. went to meet him, and sought to secure his favour by presents. He appeared to have gained his confidence, when suddenly, after a sitting of the council, he and Count Hoorn were treacherously seized, and carried to the citadel of Ghent. The states of Brabant sought to withdraw E. from the bloody tribunal, as it was called, instituted by Alba, and E., as a knight of the Golden Fleece, denied its competency. But all in vain. He was called upon to justify himself against ninety counts of accusation; and as he persisted in protesting against the incompetency of the court, and thus left many of the points unanswered, he was held guilty of contumacy, and along with Count Hoorn condemned to death. On the following day, June 4, 1568, they were both beheaded in the market-place of Brussels. Although E. hoped for pardon to the last, and intercession was made for him from the highest quarters, he died with the greatest composure. It is related that as he received the fatal stroke, Johanna Lavil, who had been his mistress, fell down dead, and the people, in a paroxysm of sympathy, dipped handkerchiefs in the blood that seemed shed in martyrdom to freedom. E. left eleven legitimate children, of whom three were sons. The whole of his property, movable and immovable, was confiscated with the greatest rigour. See *Correspondance de Marguerite d'Autriche, Duchesse de Parma* (Bruss. 1842), and *Correspondance de Philippe II. sur les Affaires des Pays-Bas* (Bruss. 1848—1851, 2 vols.). Goethe has made the death of E. the subject of a tragedy.

**E'GRET**, a name often given to various species of Heron (q. v.), particularly those which, at least during the breeding season, have the feathers on the lower part of the back lengthened and their barbs loose, so that this part of the plumage is very soft and flowing. Most of the egrets have beautiful white plumage. The distinction between egrets and other herons is not, however, very strongly marked, and the names are often used indiscriminately, although the name E. is never given to the common heron. E. plumes are used for ornamental purposes, particularly the occipital crest and scapulars of the LITTLE E. (*Ardea garzetta*); and the name E. (Fr. *aigrette*) has become a common term for a tuft of feathers, although it is said to be derived from the French *aigre*, harsh, on account of the harshness of the voice of the bird. In old English bills of fare, egrets are mentioned as if they were abundant; and not fewer than 1000 'egrittes' are included in the bill of fare of a single great feast, given at the enthronisation of George Neville, Archbishop of York, in the reign of Edward IV.; but as there is no other evidence that any species of E. was ever otherwise than of very rare occurrence in Britain, great probability seems to attach to the opinion originally advanced by Dr Fleming, that perhaps the lapwing might be meant, 'the most common bird with a crest.'

Little Egret (*Ardea garzetta*).

**E'GYPT**, a country in North-east Africa, extending from the Mediterranean to the first cataract of the Nile, that of Syene, from lat. 24° 6' to 31° 36' N. The name is derived from the Greek *Aigyptos*, a word of uncertain derivation, and as old as the age of Homer. In the Hieroglyphs and Coptic, it was called *Kemi* or the Black Land, from the colour of the soil; and by the Hebrews *Masr* or *Mitsraim*, modified by the Assyrians into *Musr*, and by the Persians into *Mudraya*. The country may be described as the bed of the Nile, the cultivated territory only extending to the limits of the inundation. This river runs from the cataracts of Assouan, in a northerly direction, to Denderah, where there is one great bend to the west; and a few miles north of Cairo (lat. 30° 15' N.), the river divides into two main streams, forming the Rosetta and Damietta branches. The other five mouths, which existed in antiquity, have silted up; the alluvial district enclosed by these mouths, and supposed by the ancients to have been gained from the sea, formed the ancient Delta. The basin of the Nile is formed by the ranges of the Arabian hills on the east, and the Libyan on the west side. The rate of deposit of mud is supposed to be about 6 inches in a century. The eastern chain of mountains rises to about 1000 feet above the level of the sea. The great physical peculiarity of Egypt is the absence of rain, the land being only irrigated by the annual overflow of the Nile. The climate is remarkably mild and sound, especially south of the Delta; and in the desert, from Cairo to Alexandria, the air contains more moisture than to the south. From the middle of August to December, west winds prevail; east winds from that time till March; after that, unhealthy south winds or Khamsin till June; and from June till August the north or Etesian winds. Earthquakes are occasionally felt;



Egypt.

and the temperature varies from 84° F. to 32°. The most remarkable phenomenon is, however, the regular increase of the Nile, fed by the fall of the tropical rains, which commence in 11° N. lat., in the spring; and falling first into the White, and then Blue Nile, reach Egypt in the middle, and the Delta in the end of June. In the middle of July, the red water appears, and the rise may be dated from that time; it attains its maximum at the end of September, and begins to decline visibly in the middle of October, and subsides to its minimum in April. At the end of November, the irrigated land has dried, and is sown, and is covered with green crops, which last till the end of February. In March is the harvest. The state of the Nile, in fact, marks the season more accurately than the variation of temperature. E. is by no means remarkably healthy, as, in addition to the visitations of plague and cholera, ophthalmia, diarrhœa, dysentery, and boils often prevail, and European, and even Nigritic races cannot be acclimatised.

*Geology.*—E. is separated from Nubia by a low hilly region about fifty miles broad from north to south, composed of granitic rocks. The same crystalline rocks extend up the shore of the Red Sea to near the opening of the Gulf of Suez, stretching inland for fully thirty miles. The scenery in this district is wild and rude, and the course of the Nile is frequently interrupted by cliffs and broken masses of granite, forming magnificent cataracts. The granitic region terminates at Assouan, the ancient Syene. From the rocks here were obtained the materials for the colossal and monolithic monuments of Egypt. The valley of Upper Egypt is bounded by two ranges of hills running northward—the Arabian range on the right, the Libyan on the left of the river, both alike composed of cretaceous strata, the predominant rock being sandstone. This is a durable and easily worked stone, and was consequently extensively used in the erection of ancient temples. The city of Thebes was built of it. The cretaceous sandstone extends from the granitic rocks forming the first cataract at Assouan for about 85 miles to Esnê, where it is covered by a limestone belonging to the upper chalk series. This continues on both sides of the valley for about 130 miles, when it is covered by a tertiary nummulite limestone, which forms the further prolongation northward of both ranges of hills. Because of the easy disintegration of these beds, the scenery in the limestone districts is tame and monotonous; frequent table-lands occur, on one of which are built the three pyramids of Gizeh, the material employed being the predominant limestone.

Over a large extent of E., these rocks are covered with moving desert sands, and in the flat lands bordering the Nile, with the alluvium brought down by its waters, and which has formed the Delta at its mouth. This alluvium consists of an argillaceous earth or loam, more or less mixed with sand and a quartzose sand, probably derived from the adjacent deserts by violent winds. It is remarkable that this sedimentary deposit has no traces of stratification, and also that within short distances, great varieties are observed in what are apparently synchronous deposits. Mr Horner's recent examination of the Nile deposits, and the striking conclusions he deduces from his observations, have caused considerable attention to be paid to these deposits lately. See Memphis.

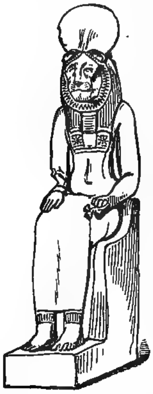
*Natural History and Productions.*—The fertile valley of the Nile and the desert regions which enclose it, are very different, not only in their botany, but in their zoology. One of the most notable of Egyptian quadrupeds is the hippopotamus, which formerly reached the Delta, but is now to be seen only in the more southern parts of the Nile. The giraffe is occasionally found within the southern borders of Egypt. The jackal and hyæna are common; also the ichneumon (q. v.), so much celebrated among the ancients; and the jerboa. The one-humped camel was originally introduced by the Ptolemies for the transit of the Indian trade. The other usual domestic quadrupeds have existed from the most ancient times. Of domestic birds, water-fowl were anciently the most numerous; the gallinaceous poultry now common not being probably of older date than the Persian invasion. Pigeons have always been abundant. The Egyptian vulture (q. v.) is a common and notable bird, as is also the ibis (q. v.), held sacred by the ancient Egyptians, and of which many fables have been related. The ostrich sometimes occurs in the desert. Of reptiles, the most famous is the crocodile of the Nile: monitors (q. v.) are also abundant, saurian reptiles of considerable size. Smaller lizards abound. The trionyx, or soft tortoise, is plentiful in the Nile. Serpents are numerous: amongst the most venomous and dreaded of which are the asp (q. v.) or haje, and the cerastes (q. v.). E. abounds in fish, the most remarkable being the Binny (see Barbel), the *Latus* (one of the perch family), the Bayad or *Silurus*, the *Chromis Nilotica*, and the *Mormyrus oxyrhynchus*. The sacred beetle (*Scarabæus sacer*) is one of the most remarkable insects. Locusts are a dreaded pest. E. is still notable also for the abundance of the other creatures mentioned by Moses as its plagues.—Many of the European trees and plants are found in E.; the date-palm, the doom-palm, the sycamore, acacias, tamarisks, &c., are among its more peculiar botanical productions; also the papyrus (*p-apu*), which anciently supplied material for paper, and the lotus (*shnin*) or water-lily of the Nile. The extensive culture of papyrus has been, in modern times, replaced by that of the sugar-cane, cotton, indigo, and tobacco; and the plant has almost disappeared. Gourds and melons have always abounded. To the wheat and barley of antiquity have been added maize and durra. E. is very deficient in timber trees; the Pharaohs obtained cedar from Lebanon and ebony from Ethiopia. The rocks of E. afforded the stones used in its edifices and sculptures; granite, syenite, basalt (at Assouan), breccia (in the Cosseir Rood), porphyry (from the quarries of Gebel Doshan, opened in the reign of the Emperor Claudius), sandstone, and limestone. Alabaster (found at Tel-el-amarna) has been used from the earliest periods to the present day. Emeralds are produced by the mines of Gebel Zabara; salt, natron, and—since 1850—sulphur, are among the other mineral productions of Egypt.

*Divisions.*—The country was anciently divided into 44 nomes—22 in Upper, and as many in Lower Egypt. Each nome or department had a separate local municipal government of a nomarch or lieutenant-governor, *ha*, besides governors of the cities, of the temples, scribes, judges, and other functionaries. Their limits were measured and defined by landmarks. This division, as old as the 4th dynasty, varied in number at different times. Under Sethos I. or Sesostris, there were 36 nomes—10 in the Thebaid, 10 in the Delta, and 16 in Middle Egypt. At the time of the geographer Ptolemy, there were 47—the Antinoites having been added. The country beyond the cataracts to Hierosycaminos was named at the Roman period Dodekaskoinos. In 400 A.D., Egypt was divided into Augusta Prima and Secunda on the east, and Ægyptiaca on the west, the Heptanomis as far as Oxyrhynchus was named Arabia, then Thebais Proxima as far as Panopolis, and Thebais Supra to Philæ. Under the Arabs, E. has been divided into Masr-el-Bahri or the Delta; the Faioum, El Bostani, or Middle Egypt; and Es Said or Upper Egypt.

The most remarkable antiquities of the country will be found described under the names of the places where they occur: see ABOUSAMBUL, ALEXANDRIA, EDFOU, MEMPHIS, THEBES, &c.; while the more remarkable objects of antiquity will be given under their names, as NILOMETER, OBELISK, PYRAMID, &c.

The *population* of the country must have been large at the earliest period, as 100,000 men were employed in the construction of the Great Pyramid alone during the 4th dynasty. It has been placed at 7,000,000 under the Pharaohs, distributed in 1800 towns, which had increased to 2000 under Amasis, 525 B.C., and upwards of 3000 under the Ptolemies. In the reign of Nero, it amounted to 7,500,000, without the natives of Alexandria, which at the time of Diodorus contained 300,000 inhabitants. By the census of 1859, the population was 5,125,000, although by that of 1844 it was as low as 2,500,000. The great bulk of the inhabitants consists of native Mohammedans; the Copts (q. v.) are estimated at 150,000, and the rest is composed of Bedouin Arabs, Negroes, Abyssinians, Turks, Syrians, Greeks, Armenians, Jews, and Western Europeans. The original population appears, both from the language and the physical conformation of the mummies, to have been of Asiatic origin, afterwards blended with Ethiopian by subsequent irruptions and conquests; but there appears to have been an aboriginal race at an early period, of copper colour, fair proportioned, although with rather thin legs, large feet, rather high cheekbones, and large lips. According to Herodotus, Diodorus, and Plato, the system of castes prevailed in Egypt. The first of these authors says there were seven castes—of priests, warriors, cowherds, swineherds, innkeepers, interpreters, and pilots. Diodorus makes only five—priests, soldiers, cultivators, shepherds, and artisans; and Plato the same. The evidence of the monuments, however, shews that these were rather conditions of society than castes, as the different orders not only intermarried, but even, as in the case of priests and soldiers, held both employments. As in all bureaucracies, the sons often obtained the same employments as their fathers.

*Religion.*—The Egyptian religion was a philosophical pantheism, the various attributes of the Deity being divided amongst the different gods of the Pantheon. Unlike the Greek, where a god was honoured in a separate temple, each Egyptian divinity was accompanied by a *put* or 'company' of companion-gods. The principal nomes and cities had each a family group of gods, consisting of a parent deity, a wife and sister, and a son. Thus Ptah or Vulcan, the eponymous and principal god of Memphis, formed a circle with the goddesses Pasht and Bast; and his son Nefer Tum, Amen Ra at Thebes, was allied with Mu, Nit, and Khonsu. These tetrads, or rather triads, for the female principle was dualised, were often accompanied by inferior deities; and personifications of the elements, passions, and senses, and feelings were introduced. The worship of some triads, however, became universal—that of Osiris, Isis, and Horus being found all over Egypt at the earliest period. The gods, indeed, are stated by the Greeks to have been divided into three or more orders. The first contained eight gods; the second, twelve; the third, an unknown number. The eight gods of the first order were Ptah, Ra, Shu, Seb, Osiris, Set or Typhon, and Horus, according to the Memphite; and Amen, Mentu, Atum, Shu, Seb, Osiris, Set, Horus, and Sebak, according to the Theban version. Great uncertainty prevails about the gods of the second and third order, and still greater difficulty about the genesis and nature of the gods, different doctrines prevailing at different times and places; and the tendency to fuse different gods into one, particularly at a later period: Amen Ra, for example, being identified with Horus; and Horus, Ra, Chnum, Mentu, and Tum being merely considered the sun at different periods of his diurnal course. Very little light is thrown on the esoteric nature of the deities by the monuments, and the classical sources are untrustworthy; but the antagonism of good and evil is shewn by the opposition of the solar gods and the great dragon Apap, a type of darkness, and the hostility of Osiris and Set or Typhon. Some of the gods were self-existent, others emanated from a father, and some were born of a mother only, and others were the children of greater gods. Their energies and powers differed, and their types, generally with human bodies, have often the heads of the animals which were their living emblems, instead of the human. A few foreign deities became at the close of the 18th dynasty engrafted into the religious system—as *Bar*, Baal; *Ashtarata*, Ashtaroth; *Anta*, Anaitis; *Ken*, Kiun; *Reshpu*, Reseph; *Set*, Satan. All the gods had human passions and affections, and their mode of action was material; they walked on earth, or sailed through ethereal space on boats. The principal deities are Ptah, the opener, represented as a bow-legged dwarf or fœtus; the Phœnician Pataikos, the creator of the world, the sun and moon, out of chaos (*ha*) or matter (*Mu*), to whom belong Pasht, 'the lioness,' and Bast, Bubastis, lion-headed goddesses presiding over fire, and Nefer Tum, his son, a god wearing a lotus on his head. Next in the cosmic order is Khnum—worshipped at Elephantine—the ram-headed god of the liquid element, who also created the matter of which the gods were made; and connected with him are the goddesses Heka the Frog, or primeval formation, Sati, or 'sunbeam,' and Anuka, alluding to the genesis of the cosmos. The Theban triad comprised Amen Ra, 'the hidden' power of the sun, the Jupiter; *Mu*, the 'Mother' goddess or 'Matter,' the Juno; *Nat*, the 'Shuttle,' the Minerva; and Khonsu, 'Force' or Hercules, a lunar type. A subordinate type of Ammon is Khem, 'the enshrined,' who, as *Harnekht*, or Powerful Horus, unites beginning and end, or cause and effect. The solar worship comprises *Ra*, the Sun, who traversing the '*sba*, or empyreal space of Gates, passes each hour a separate region, and as he descends behind the west hills of the horizon, becomes Atum, also a demiurge; while as Mentu, a hawk-headed god, he is Mars, and as Khepra, a scarab-headed god, the male creative or existent principle, and is identified with Amen, Khnum, and other deities. Day and night, Ra and his satellites pursue the Apap or 'Giant' Darkness with alternate success. The souls of the blessed


Pasht.

Amen Ra.

come off from earth, and entering the boat of Ra, there enjoy the perpetual streams of light which emanate from his orb. From *Ra* or Helios spring Shu and Tef the Gemini, Athor and Ma. *Seb* or 'Time,' and *Nu* or the 'Firmament,' gave birth to Osiris, Isis, Nephthys, Set, and the elder Horus, a group of terrestrial and infernal deities. The myth of Osiris destroyed by his brother Set, hewn in pieces, recovered by Isis, and avenged by Horus his son, embalmed by Anubis and the genii of the dead, and defended by Thoth, the Egyptian Logos, at the 'great judgment' before his accusers, Set and the conspirators, was the type of the judgment and future destiny of man, and all deceased were called by his name. See OSIRIS. Numerous inferior deities, such as Hapi, the Nile, appear either as other forms of the superior deities or local varieties of the myths. Each deity had its sacred animal, which received a local worship, and which was considered to be the 'second life' of the deity it represented. The special animal selected was installed in the adytum of the temple, and gave oracular responses. The most remarkable of these animals was the Apis bull of Memphis, whose worship had a national extension. The Egyptians believed in the transmigration of souls, and all not sufficiently pure to be admitted into the courts of the sun, or whose bodies had perished before the expiration of 3000 years, passed from body to body (see EMBALMING), having first descended to the Hades, and passed through the appointed trials and regions, endeavouring to reach the manifestation to light. In this progress, the soul was required to know and tell the names of the doors, regions, and their guardian demons through which it had to pass.

Anup, or Anubis.

Thoth.

*Chronology and History.*—One of the most important points of Egyptian history is the chronological, involving as it does the date of the earliest historical epoch of man. In the time of Ptolemy Philadelphus, in the 3d c. B.C., Manetho of Sebennytus, high-priest of Heliopolis, drew up, at the request of the king, a history, in which he divided the space of time from Menes to the reconquest of Egypt by Darius II. into 30 dynasties. The work of Manetho has perished, but chronological epitomes remain in the works of Julius Africanus, a writer of 300 A.D., and Eusebius, and George the Syncellus, 800 A.D. Besides the Bible, Herodotus, Diodorus, Josephus, and other writers, especially Eratosthenes, also contained sources of chronological information, and the learned of Europe for the last three centuries had endeavoured to reconcile the conflicting statements of these authors, the discrepancy of their ciphers, and the inaccuracy of their details. Even in Biblical chronology, the Hebrew, Samaritan, and Septuagint versions gave very different results; but in England the chronology of Usher, which, from the Hebrew, placed 4004 B.C. as the date of creation, and 2348 B.C. for the Deluge, has somehow obtained the sanction of theological writers. To reconcile these conflicting authorities, two schools of chronological critics, called of the Long and Short Chronology, have arisen, and the epoch of Menes has been placed by the advocates of the long chronology, as Boöckh, at 5702 B.C., by Bunsen, at 3643 B.C., by Lepsius, at 3892 B.C., by Henry, at 5305 B.C.; while the same date falls, according to Sharpe, 2000 B.C., to Nolan, 2673 B.C., and Poole, 2717 B.C. Unfortunately, the monumental information is defective at certain periods, while in all, the national custom of dating in kings' reigns only, without the use of the controlling date of any cycle, renders the subject still more obscure; for the Sothic cycle, or Dogstar period of 1461 vague years, was not in official use. The celebrated hieratic papyrus at Turin, of the age of the 19th dynasty, which contained a system of chronology arranged on a principle of cyclic and regnal years, has unfortunately suffered so much mutilation that it is impossible to reconstruct it satisfactorily. It is therefore better to arrange the history according to the dynastic successions of Manetho, giving these as waves of time, leaving the question of their duration to individual judgment. At present, the elaborate systems of chronology are only chronological draughts from recollection of a vast ruin, each more or less happy or defective in some particular respects or general conception. There are not sufficient monumental data for a sure conclusion about the remoter dynasties. Mythically, Egypt was said to have been first governed by a dynasty of gods, who, according to Manetho and other Greek authors, were Vulcan or Ptah, Helios the Sun or Ra, Sôs or Shu, Saturn or Seb, Osiris or Heshar, Typhon or Seti, and Horus or Hor. These gods reigned 13,900 years, and were succeeded by the Manes and demigods, whose reign occupied 4000 more years. But considerable difference exists in the lists—that of Thebes giving Amen, Mentu, Tum, Su and Seb, Osiris, Seti, and Horus; that of Memphis, Ptah, Ra, Shu, Seb, Osiris, Set, and Horus. After the reigns of the gods, the epoch of Menes is the first point in the chronology of the history of ancient Egypt, and has been placed, as above mentioned, by the rival systems of chronology.

No contemporary monuments of Menes exist, but he is said by tradition to have corrupted the simplicity of the patriarchal life of the nation, instituted the first laws, and divine worship, founded the temple of Ptah by turning the course of the Nile, by means of a barrage, to the west at Kosheishe, and to have founded Mennefer or Memphis, after some expeditions against the Libyans, and to have been devoured by a crocodile. The statue of Menes is represented borne in ancestral procession in the reigns of Rameses II. and III. at Thebes, but no contemporary monument of this monarch exists. His successor Athothis, wrote a work upon anatomy, and built the palace of Memphis. The other kings of this dynasty were Kenkenes, Venephes, who built the Pyramids at Ko or Kochome, Miebis, Semempses, and Bieneches; but their names have not been identified, nor do any monuments of them remain. This dynasty reigned about 250 years, and was succeeded by the 2d, which lasted about 300 years, but of which no contemporary monuments remain. This dynasty, however, introduced the worship of sacred animals, and abolished the Salic law, which had hitherto prevailed. With the 3d dynasty of Memphites, which endured about 200 years, monumental history properly begins, the monumental king Seneferu of this dynasty having conquered the Sinaitic peninsula, and opened the copper mines of the Wady Magara. The 4th dynasty, also of Memphites, had an existence of 284 years. The celebrated canon of Turin contains fragments of the duration of the reigns and lives of the monarchs of this line, some of which were prolonged to upwards of 90 years. Monumental remains are found of Soris. The two Khufus built the two great Pyramids of Gizeh, and held the Arabian peninsula in subjection. Cheops, or the elder of the two Khufus, constructed the largest of this group of the pyramids by means of a forced conscription, and was regarded as a detestable and impious tyrant. Subsequently, he repented, and wrote a book in honour of the gods, which enjoyed a great reputation. Khafren, his successor, built the second of the great pyramids, and Mencheres, or Mycerinus, the third pyramid. The so-called book of the Ritual, which dates from this period, and the high civilisation which Memphis had then attained, mark an epoch in Egyptian civilisation, and the numerous tombs, in the vicinity of the pyramid, constructed during this and the subsequent dynasty, exhibit a highly progressing state of civilisation; the cultivation of farms, the chase, the arts, enjoyed a great deal of the attention of the Egyptians; but horses and wheel-carriages were alike unknown, although the simpler mechanical instruments and manufactured articles had been invented.

The 4th dynasty began, according to Lepsius, 3427 B.C. The 5th, which monumentally appears a continuation of the 4th, terminates with Annos or Onnos, who was killed by his guards. His sepulchre was the pyramid of the Mastabat-el-Faraoun, near Saqqarah. This 5th dynasty was, however, from Elephantine, and appears to have ruled in Upper as well as Lower Egypt, monuments of it being found in the Thebaid. Considerable difference, however, exists between Lepsius and Bunsen in the assignment of the royal cartouches of this period, Lepsius assigning them to the 5th, and Bunsen to the 3d dynasty. The group of the Abooseer Pyramids is of this age. The next dynasty, the 6th, a Memphite, was more remarkable, and tombs and numerous small objects of the period are found in Upper and Central Egypt, and in the valley of Hamamat, leading from Coptos to the Red Sea. The principal monarchs of this line were Othoes, killed by his guards; Phiops or Apappus, whose reign extended to 100 years; and Nitocris, whom the legends represent as drowning the murderers of her brother, and constructing the third Gizeh Pyramid, in which she was buried, and which she perhaps enlarged from the old original sepulchre of Mycerinus, having added to it the revetment of red syenitic granite. Of the 7th dynasty, two names, An and Assa, are supposed to have been found; but the monumental connection between the close of the 6th and 11th dynasties, has not been even conjecturally restored, from the conflicting tablets of Karnak and Abydos, and the mutilated papyrus of Turin. It is not possible to follow the order of the succession till the 11th dynasty, nor are there monuments either of a public or sepulchral nature to shew the existence of the intermediate period, rendered more unintelligible by the contemptuous silence of the lists of Manetho, one tyrant, Achthoes, being alone mentioned in them. Considerable discrepancy exists between the canon of Turin and the lists of Manetho relative to this period; the canon making two dynasties—one of six, the other of 17 kings between the 6th and the 12th dynasty; Manetho, 86 kings, and about 500 years. The impossibility of reconciling these statements has given rise to the idea, that the lists were respectively Memphite and Theban, each having contemporary kings. The existence, however, of the 11th dynasty, consisting of a line of monarchs called Hantefs and Mentuhetps, has been proved by the discoveries of their coffins in the tombs at Gournah and the El Assasifs, and the tablets of the island of Konosso and others, referring to the construction of the fortress of Coptos and in honour of the local god. The successive reigns and monarchs of the 12th dynasty are fixed by numerous monuments. Amenemha I., the founder of the line, opened the quarries of Tourah, embellished An or Heliopolis, and founded the temple of Amen at Thebes, reigning nine years alone, and seven with Osirtesen I., his successor. A historical papyrus recording his dreams and other facts of this reign remains. The monuments of Osirtesen I. exist in the Faioum at Benihassan and Heliopolis; he subjected some of the Ethiopian tribes. During his reign there occurred a famine; and in the 38th year of his reign, he associated Amenemha II. into the government for four years. Little of historical import is known of his successors, Amenemha II. and Osirtesen II., except their conquest of Kash or Ethiopia, and the arrival of a tribe of 36 Amu or Semitics in the sixth year of Osirtesen II. These resemble, in their costume and physiognomy, the Hebrews, and have been supposed to represent the arrival of Jacob in Egypt. Osirtesen III., his successor, established the southern frontier at Samneh, which he fortified; and was subsequently deified in Nubia, and received, in the reign of Thothmes III., a worship in that region, and fortified Coptos. His successor, Amenemha III., excavated the Birket-el-Keroun or Mœris lake; constructed the Labyrinth, composed of 6000 rooms; the Pyramid of Crocodilopolis, in its vicinity; and the temple of the goddess Athor at the Sarabout-el-Khadem. His successors, Amenemha IV. and the queen Sebeknefru, are only known from the remains of the Labyrinth, and some inferior monuments. The same difficulty of tracing the succession which exists between the 6th and 12th, occurs again between the 12th and 15th. The most plausible conjecture, however, is that the 13th (Diospolite) and the 14th Xoite dynasty, in Lower Egypt, were contemporaneous, and that the 15th and 16th Theban and Diospolitan had for their contemporaries the 17th Hykshos or Shepherd dynasty in Lower Egypt. The monarchs of the 14th dynasty appear from the monuments to have been occupied in regulating the course of the Nile at Samneh, while their power reached from the isle of Argo to El Hamamat, and they engaged in traffic with the Phœnicians. About 2000 B. C., the advance of the Assyrians in Asia, or some internal revolution, precipitated the so-called Hykshos or Shepherd Kings, who appear to have been Arabs or Phœnicians, on Lower Egypt. These invaders overthrew the Xoite dynasty of Lower Egypt, took Memphis by assault, and established themselves in the city of Haouar or Avaris, subsequently called Tanis, where their monuments still exist. But the Egyptian rulers of Upper Egypt overthrew their rule, and under Ra-skenen, the last king of the 16th dynasty, Avaris was invested, while his successor, Aahmes I., of the 17th, took it by assault, besieged Sarahan or Sharon, and attacked the mountaineers of Nubia. The Hykshos endeavoured to substitute the worship of Sut or Set for Ra or the Sun, but Aahmes I. restored the ancient temples, and opened the quarries of Tourah. Amenophis I., his son and successor, who reigned under the tutelage of his mother, continued the Ethiopian campaigns, and embellished Thebes. Thothmes I. carried his arms to Tombos, in the heart of Nubia, and into

Naharaina or Mesopotamia, and embellished Thebes. Thothmes II., who reigned under the guardianship of Hatasu, defeated the Shos. His brother and successor, Thothmes III., elevated E. to the highest pinnacle of glory; and by the victory of Megiddo, in his 23d year, subjected the whole of Syria and part of Mesopotamia to his arms, receiving immense tributes from Kash and the Ethiopian races of the south, the islands of the sea, and Assyria, Babylon, Phœnicia, and Central Asia, and endowing the Temple of Thebes with the revenues of tributary cities. A calendar preserved at Elephantine recording the heliacal rise of the Dog-star on the 28th Epiphi, shews that the year 1444 B.C. fell in his reign. Thothmes III. recovered the copper mines of Magarah, and decorated all Egypt. Amenophis II. continued the conquests of the Ruten, took Nineveh by assault, and vanquished the Ethiopians. Thothmes IV. is supposed to have erected the Great Sphinx. Amenophis III. maintained the frontiers of the empire. At this period, a heresy became introduced into E., favoured by the queen Taia. Amenophis IV. became a worshipper of the Aten or solar orb, to the exclusion of the other deities of E., especially of Amen Ra. The capital was removed to Tel-el-Amarna or Alabastron; the king changed his name to Akhuenatnen, and a succession of three heretic monarchs ruled E. for about 33 years, till Haremhebi or Horus restored the orthodox faith and the limits of empire.

Head of
Thothmes III.

The link which connects the last monarchs of the 18th to the monarchs of the 19th dynasty has been lost; but Horus was succeeded by Rameses I.—the first of a long line of monarchs—who appears to have formed a treaty with the Khita or Hittites, and to have advanced the conquests of E. to the Wady Halfa. He was succeeded by Seti I. or Sethos, who attacked the Remenu or Armenians, the Rutennu, and the Shasu or Shepherds, who had again advanced to the Pa-khetem or Pithoum, on the confines of Egypt. Naharaina or Mesopotamia, and Sharu or Syria, Pânt or Phœnicia, had also been invaded by his arms. The city of Atsh or Katsh, the supposed Cadytis, was also besieged by Sethos, whose Asiatic victories introduced into E. the worship of Baal and Ashtaroth. Tyre, Avathus, and Bethanath in Canaan, were garrisoned by his forces. E. was also embellished with many noble monuments in his reign. He was buried in a deep excavated rock-tomb in the Biban-el-Molook—the kings of the 18th and 19th dynasties having substituted long excavated tunnels or syringes, in the mountains of the Arabian chain of Western Thebes, for the ostentatious pyramids in use from the 4th to the 12th dynasty, which attracted the cupidity of the invaders of Egypt. Rameses II., the son of Seti I., seems to have succeeded him at the very youthful age of seven. In his fifth year, he defeated the Khita and their Syrian confederates at the battle of Katsh, in which many of the princes and officers of the Khita were drowned in the river Arunata, or Orontes. The battle endured two days, and the panegyric of an Egyptian scribe, Pentaur, has invested Rameses with the power of a god. The war lasted till his ninth year, and the king took Shaluma or Salem, the ancient site of Jerusalem, and other cities. In his twenty-first year, a treaty of peace and extradition was established between the two countries, and Rameses married a princess of this nation. It is the tablet of this monarch which is found at the Nahr-el-Kelb, or Passes of the Lycus, near Beyrout. This monarch subjected Ethiopia, which had revolted, to his arms, reimposed the tribute, and placed the country again under the government of the princes of Ethiopia, or Egyptian viceroys. He also established a fleet on the Mediterranean. His name and reputation formed the basis of the legendary Sesostris; the exploits of the monarchs of the 18th dynasty, and probably of his successors, being united with his fame. The reign of Rameses, although it exhibits a decline of art, yet demonstrates E. to have been in the height of its glory; and his epoch appears to have been about 1322 B. C., a special calendar having been sculptured to record the coincidence of the heliacal rising of the Dog-star and 1st Thoth, or commencement of the fixed and canicular year. His place of burial is uncertain—perhaps in the vaults of the Ramesseum. His thirteenth son, Merienptah or Menephthes, succeeded him upon the throne, transferred the capital to Memphis, successfully contended with the Tamahu or Libyans and the Rabu, and appears to be the Amenophis of Manetho, and the Pharaoh of the Exodus. He introduced the heretical worship of Sut, Seth, or Typhon, and was succeeded by Sethos II., Amenmes, Sipthah, Tausri, and Setinekht, whose inglorious reigns close the 19th dynasty. The connection of Rameses III. with the previous dynasty is obscure. This monarch was chiefly at war with the Philistines, and the other maritime tribes of Greece and Asia Minor, and gained naval victories in the Mediterranean, and repeated the conquest of Ethiopia. He was followed by the splendid but inglorious line of the Ramessids, the sixth of whom gained victories in Ethiopia; and the twelfth of whom, having married a princess of the land of Bakhten, sent the ark of the god Khous to Bakhten, at the request of the monarch of that country, for the cure of the queen's sister. The fall of this dynasty appears to have been owing to internal revolution, as their Tanite successors held the office of high priests of Amen Ra at Thebes. They held the government for 130 years, and entertained foreign relations, one of the monarchs having married a princess of the Rutennu. The 22d dynasty, the monumental, is rather confused. They were also high priests of Amen Ra. Shashank I. is the Biblical Shishak. His invasion

Rameses II.

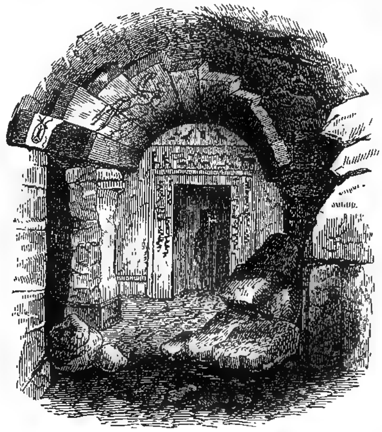
of Israel, with 12,000 chariots and 60,000 cavalry, and the capture of Jerusalem, is recorded on the portico of the Bubastites at Karnak. The other monarchs of this line, Osorkon I., Takelot I., and their successors, have left no remarkable records; and the dynasty, which appears of foreign origin, is more chronologically than historically important, the taking of Jerusalem falling between 989 and 959 B. C. The 23d Tanite dynasty, which succeeded it, exhibits a decadence in E., and was succeeded by the 24th dynasty, of a single monarch, the celebrated Bekenrenf or Bocchoris, who reformed the laws; but having been taken prisoner by the Ethiopian Sabaco, of the 25th dynasty, was burned alive. From this period, the history of E. becomes involved with that of Judæa and Greece. Tirhaka came to the assistance of Hezekiah against Sennacherib, and built the temple of Gebel Barkal. According to this Assyrian cuneiform inscription, the Ethiopians were expelled by the Assyrians, and the country placed under various monarchs. This state of affairs was closed by the rise of Psammitichus I. of the 26th dynasty, who, by the aid of Greek mercenaries, overthrew the other petty princes. His age marks a revival in art, and restoration of the old constitution of the empire. His successor, Nekao or Nechos II., planned the canal across the isthmus of Suez, from which he desisted, warned by the advice of an oracle, after having lost 120,000 men in the attempt. Under his reign, the Phœnician navigators first passed the line. After defeating Josiah, king of Judah, and conquering Palestine, he was himself defeated by Nebuchadnezzar at Karkemish. Psammitichus II. carried his arms into Ethiopia. Apries, his successor, having lost all the conquests, was deposed by Amasis, his successor, and strangled. Amasis favoured in different ways the Greek colonies in E., and married a Cyrenæan wife, and conquered Cyprus, but incurred the enmity of Cambyses, who overthrew his son and successor at the battle of Pelusium (526—527 B. C.). Cambyses treated E. with considerable moderation, but after an unsuccessful expedition against the Ethiopians, lost his reason, stabbed the bull Apis, and committed various atrocities. His successor, Darius I., governed E. with more prudence; but Xerxes I. and Artaxerxès I. had successively to reduce it to subjection, which they did in spite of assistance rendered to it by the Athenians. The 27th dynasty of Persians was followed by the Saite line, the 28th, Amyrtæus and Pausiris, who still held ground against the Persians; the 29th, Mendesian dynasty of Nepherches and Achoreus, maintained a Greek alliance; and the 30th, Sebennytic, consisted of Nectanebes I., who successfully resisted Pharnabazus and the Iphicrates; of Teos, who employed Agesilaus; and Nectanebes II., who fled into Ethiopia before the Persians (340 B. C.).

From this time, E. remained a province of Persia till its conquest by Alexander the Great, who founded Alexandria. Subsequently, E. passed under the Greek rule, and the language of the government, and the administration and philosophy, became essentially Greek. The court of the Ptolemies became the centre of learning and philosophy; and Ptolemy Philadelphus, successful in his external wars, built the Museum, founded the library of Alexandria, purchased the most valuable of manuscripts, engaged the most celebrated professors, and had the Septuagint translation made of the Hebrew Scriptures, and the Egyptian history of Manetho drawn up. His successor, Euergetes, pushed the southern limits of his empire to Axum. Philopator (221—204 B. C.) warred with Antiochus, persecuted the Jews, and encouraged learning. Epiphanes (204—180 B. C.) encountered repeated rebellions, and was succeeded by Philometor (180—145 B. C.) and Euergetes II. (145—116 B. C.), by Soter II. and Cleopatra till 106 B. C., and by Alexander (87 B. C.), under whom Thebes rebelled; then by Cleopatra Berenice, Alexander II. (80 B. C.), and Neos Dionysus (51 B. C.), and finally by the celebrated Cleopatra; and after the battle of Actium (30 B. C.), E. passed into the condition of a province of Rome, governed always by a Roman governor of the equestrian, not senatorial rank.

The most important events in E. under the Roman rule were—the introduction of the Julian year by Augustus (24 B. C.), the visit of Vespasian to Alexandria (70 A. D.), and that of Hadrian (122 A. D.), the development of the Gnostic heresy, the visit of Caracalla (211 A. D.), the conquest of E. by Zenobia (270 A. D.), the revolt of Firmus (272 A. D.), the persecution of Diocletian (304 A. D.), and the rise of Manicheism, the great Arian controversy in the reign of Constantine, the rise of asceticism, magic, and astrology, and the final destruction of paganism (379 A. D.).

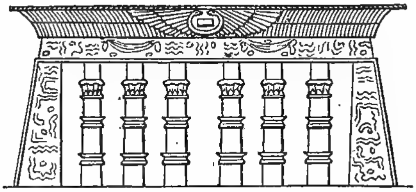
At the division of the empire (395 A. D.), E. fell to the Eastern Empire, and, at its fall, had become one of the Great Patriarchates of the Christian Church; but owing to the religious feuds of the Jacobites and Melchites, it became a province of Persia (616 A. D.) for 12 years. The Coptic governor Makaukas, who reigned in the name of Heraclius, endeavoured to make himself independent, and invited the arms of the Arabs, and Omar I. easily conquered Egypt, in the nineteenth year of the Hegira (640 A. D.). Although Alexandria was retaken by Constantine III., the Arabs drove him out, and maintained their conquest, and E. remained an appanage of the califat. It afterwards passed into the dynasty of the Thonlounides (868 A. D.), the second of whom extended his kingdom to the Euphrates; but a new dynasty, the Akshidide, succeeded in 935 A. D., to give way to the Fatimide in 969 A. D., under which Cairo was built, and Egypt regained some of its prosperity, although in 1118 A.D. Baldwin I. burned the maritime town of Faramah. Subsequently, it passed under the Ayoubites, and Saladin, who fortified Cairo, built the citadel, excavated the well, and erected the granaries of Jusuf. In 1218 A.D., the Crusaders took Damietta, but were subsequently driven back in 1221 A. D. One of the later princes, Saleh-Nedjim Eddin, built the castle of Rhodah, and created the order of Mamelukes; but Louis IX. of France (1248 A. D.) took Damietta and gained the battle of Mansourah. In 1254, the Ayoubites entirely fell, and E. became subject to the Baharite and Bordjite Mamelukes, under whose government it flourished, and even pushed its conquests to Cyprus and Asia Minor, till, in 1517, Touman Bey fell into the power of Selim I., and E. became a province of the Turks, and administered by pashas. In 1601, the use of tobacco was introduced. Constant rebellions of the Mamelukes, and the violence of contending factions, distracted the country. The most remarkable event of this period was the French invasion by Bonaparte in 1798, which, by the conquest of Alexandria, and the battle of the Pyramids against the Mamelukes, led to the entire subjection of the country, from which the French were finally expelled by the Turks and British in 1801, and the country restored to the Ottoman Porte. The rise of Mohammed Ali in 1806 imparted a galvanic prosperity to E., by the destruction of the Mamelukes, the formation of a regular army, the increase of security, the improvement of the irrigation, and the introduction of European civilisation. In 1816, Mohammed Ali rendered part of Arabia tributary by means of his son-in-law, Ibrahim; and although he lost his fleet at Navarino in 1827, he was subsequently sufficiently powerful to wrest Syria from the Porte, and to hold it as tributary by the treaty of Kutahia in 1835. Subsequently in arms against the sultan, the victory of Nisib, in 1839, would have elevated him to the throne of Constantinople; but the quadruple alliance in 1840, the fall of St Jean d'Acre to the British, and the evacuation of Syria, left him no alternative but to accept the terms of the four powers, and limit his power to the pashalik of Egypt, guaranteed to himself and his family by the Porte. In 1849, Mohammed Ali died, and was succeeded by Abbas Pasha, his grandson; but his short reign, which gave repose at least to E., terminated in 1854, when Said Pasha succeeded to the government. At the present moment, E. is chiefly under French influence, considerable part of the civil administration being in the hands of European adventurers. Amongst the numerous schemes proposed by foreign engineers may be cited the barrage of the Nile, and the canal of the Isthmus of Suez—gigantic but seemingly impracticable enterprises.

*Civilisation.*—There now only remains to consider the old civilisation of the Egyptians, which had made such strides at an early period of their history. In the sciences, as early as the 4th dynasty, the notation of time, the decimal system of numbers, weights and measures adjusted to a pound of 1400 grains, the geographical division of the country, and the division of the year (of 365 days) into three periods (of four months of 30 days) and twelve months, were already known, while the form of the buildings implies a knowledge of geometry and its sister sciences. An empirical knowledge of astronomy was probably possessed; nor could the arts have reached such a high development without some acquaintance with chemistry; and tradition assigns a knowledge of medicine and anatomy to a still earlier age. The art of literary composition also existed in the 11th dynasty, for fragments of the religious or so-called Hermetic books of that age have reached us (see PAPYRUS); and Cheops himself was an author of renown. The language of the period, although concise and obscure, was nevertheless fixed; and a code of manners and morals, under the 6th dynasty, has been handed down. Architecture had attained great refinement at an early period; not only were the chambers and temples, and other edifices, squared and directed to face the cardinal points, but the use of a kind of false arch, or stones disposed so as to form an angle overhead to relieve superincumbent pressure, *en décharge*, was practised as early as the 4th, and the vault or arch was in existence in the 11th and 18th dynasties, eight centuries before that of the Cloaca Maxima of Rome. Columns were in use as early as the 4th dynasty; and in the 12th, the so-called proto-Doric ones of Benihassan, with their cornices and triglyphs, shew that the Greeks derived this order of architecture from Egypt. The symmetric arrangement of the temples, consisting of rectangular courtyards and hypæthral halls of many columns, built before the original shrine, with their gateways, slightly converging to the apex, and their bold and severe lines, and the obelisk (see OBELISK), and the pyramid (see PYRAMID), forms admirably adapted to resist the inroad of time, not to mention the remarkably fine masonry, prove the high development this art had acquired at the remotest age. Nor was sculpture less advanced, for long before Dædalus, the statues of the 4th dynasty, at least 2000 B. C., had been moulded with great accuracy to a fixed canon; and although their architectural employment had rendered their action rectilinear—such as the arms pendent, the left foot advanced, and the feet not detached but when in stone, with the part between them reserved—and the ears were placed too high in the head, and a kind of pillar was fixed behind in standing figures, yet in portraiture they had attained to great perfection. Sculpture, indeed, in the human form was always restricted to a few conventional attitudes; but some of the lions and sphinxes are executed with a spirit surpassing the power of Greek artists. A peculiar kind of bas-relief prevailed in E., the figures being sunk below the surface like the intaglio figures of a gem, but in slightly convex relief, not concave. This style, called cavo-rilievo, or intaglio, has been most successful in preserving the hieroglyphs and

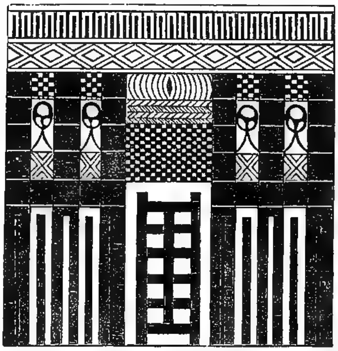


Egyptian Arch:

Tomb at Saggara, arched with stone, of the time of Psammitichus II., whose name occurs on the roof to the left, and other places.



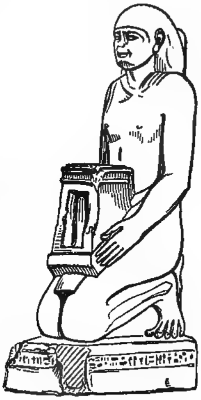
Façade of Egyptian Temple.

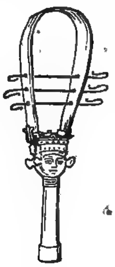


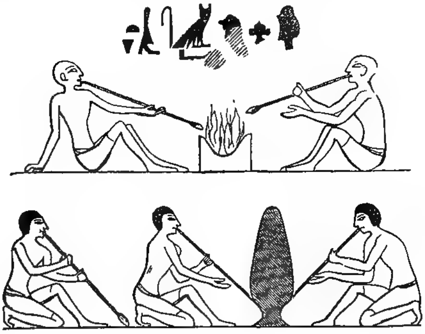
Decorated Doorway.

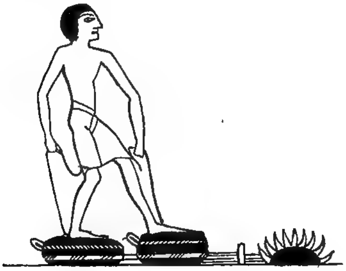
anaglyphs of the monuments. Bronze statues cast from moulds, and having a leaden or other core, were first made in E., and subsequently introduced into Greece by Rhœcus. This art flourished best under the earlier dynasties, and had much degenerated in the 19th and 20th, although subsequently revived by the 26th. Painting appeared at the same age chiefly in temperà or whitewashed surfaces, although fresco was occasionally used, and encaustic appears only under the Greeks and Romans. This art, of course, was freer than sculpture, but yet had a rigid architectural character, and followed the same canon as sculpture, the colours used being generally the pure or primitive, and the background uniformly white. The architectural details of Egyptian temples and the hieroglyphs appear to have been always coloured, and added additional charm to the sculptures. The religious papyri or rituals were also often embellished with elaborately coloured vignettes, resembling the illuminations of modern manuscripts. Nor had the Egyptians attained less eminence in the art of music, the harp and flute appearing in use as early as the 4th, and heptachord and pentachord lyres as early as the 12th dynasty; besides which, drums, tambourines, flutes, cymbals, trumpets, and guitars, are seen in the 18th, and the national instrument, the jingling sistrum, in the 4th. Many of the instruments are of great size, and must have produced considerable effect. Nor was the art of song wanting, and measured recitations or songs occur on monuments of the 12th dynasty, while the lays of Maneros traditionally dated to a still earlier period. Poetry, indeed, was at all times in use, and the antithetic genius of the language suggested the application of the strophe and antistrophe (see HIEROGLYPHICS), although it is not possible to define the metre. In the mechanical arts, many inventions had been made: the blow-pipe, used as a bellows, appears in the 5th dynasty; bellows and siphons in the 18th. The saw, the adze, the chisel, press, balance, and lever appear in the 5th, the harpoon in the 12th, razors in the 12th, the plough and other agricultural implements in the 5th. Glass of an opaque

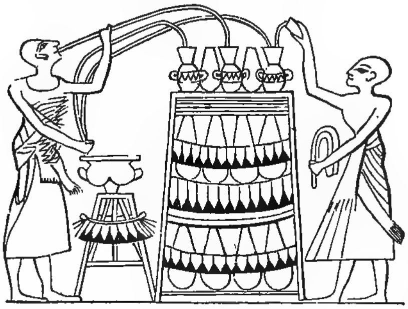
Head of Rameses II.

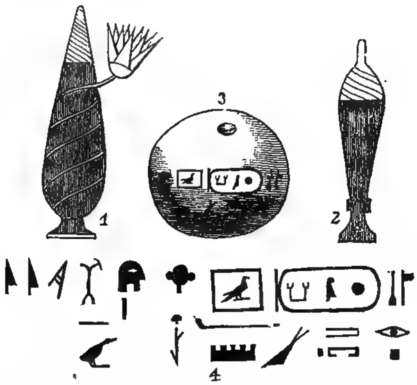

Uah-ha-ti-ra.


Sistrum.


Egyptian Glass-blowers.

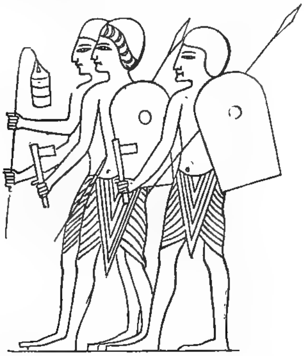

Bellows.


Siphons, used in the year 1455 B.C.



1, 2, glass bottles represented in the sculptures of Thebes; 3, Captain Henvey's glass bead, about the real size; 4, the hieroglyphics on the bead containing the name of a monarch who lived 1500 B.C.

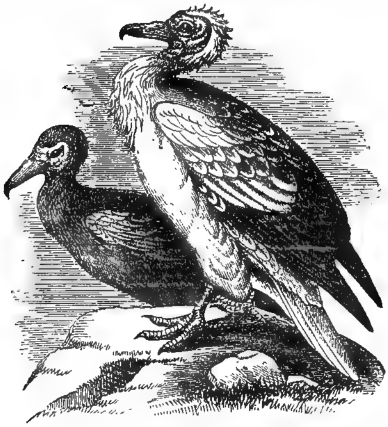
kind is seen in the 4th, and dated specimens in the reign of Thothmes III. (1445 B.C.), give the priority to E. (see GLASS); the oldest transparent glass, the Assyrian, not dating older than Sargina (711 B.C.). A glazed pottery or porcelain (see POTTERY), the potter's wheel, and the kiln, appear in the 4th; and the art of metallurgy, with the use of tin, at the same period. In the military art, the Egyptians used at an early age defensive armour of shields, cuirasses of quilted leather, and helmets; while spears, clubs, maces, swords, daggers, bows, and hatchets formed their offensive weapons. For sieges, they employed the testudo, ladders, torches and lanterns, and mines. The army was composed of infantry till the beginning of the 18th dynasty, when war-chariots were introduced; for, prior to that period, the ass only was known and used for transport; and carriages not having been invented, persons and goods were transported, on the panniers of asses, or on a kind of saddle slung between two of these useful animals. War-boats no doubt existed at an early period, and are mentioned as early as the 12th dynasty; but sea-going vessels not till the 18th, and no fleet till the 19th. The Nile, however, was constantly navigated by row-galleys with sails. An extensive commerce was carried on with neighbouring nations, and their tribute enriched the country with slaves, cattle, gems, valuable metals, and objects of curiosity. Rare animals were collected for ostentation. Under the earlier dynasties, the chief occupation of the nation appears to have been rearing cattle, cultivating grain, indulging in banquets, fishing, fowling, and the chase, and the establishment of each noble contained in itself all the organisation and artificers necessary for its maintenance. How transactions were carried on without the use of money, is not very clear, unless gold circulated moulded in the shape of rings adjusted to a given weight, but coin plate is mentioned by its pounds, *mna*, and its ounces, *kat*. The Persians first introduced money. See NUMISMATICS. The wealth of families was, however, spent on the tombs and furniture of the dead, and the preparations for embalming, which were on so vast a scale that filial piety did not disdain to mortgage not only the sepulchres, but the very mummies of its ancestors. See EMBALMING. Amusements were various, from the single-stick and juggling, the dance of almehs, the bull-fight, to draughts, dice, and morris. In fact, ancient Egypt had a material civilisation, which exerted all the requirements of industry, and forgot none of idleness. Pleasure was the object of existence, not, however, untempered by the voice of reason or the appeals of conscience, the moral code of duties being as pure as that of contemporary nations.



A Guard apparently with a Lantern.

The civil government was administered by the three upper castes. The priests, distinguished by their superior knowledge, cleanliness, and godliness, had the ecclesiastical; the temples being administered by high priests and an inferior hierarchy, with overseers, and governors of revenues, domains, and donatives. Each temple, like a monastic institution, had its carefully subdivided organisation, each denizen having a separate charge or jurisdiction. The political and civil government was administered by royal scribes, or secretaries of state, who attended to the revenue, justice, foreign affairs, and all the interests of the executive. Sacred scribes attended to the ecclesiastic interests, and inferior scribes to the local interests. The public works, the collection of grain, and of the linen dues; the cattle, workmen, wells, irrigation, had each their separate superintendents and scribes. The military force of 410,000 men, at a later period, comprising all arms of the service, was ruled with severe discipline, and under the direction of nomarchs (*ha*), colonels (*hrai*), captains (*mer*), and lieutenants (*atnu*). The criminal and civil law was administered by judges (*satem en ash*), who held travelling assizes, and to whose tribunals the necessary officers were attached. The athlophoros or standard-bearer also transmitted the decrees of the royal chancery. The execution of deeds required so many witnesses that fraud evidently often occurred. The superior position of women in the social scale, notwithstanding the permission to marry within degrees of consanguinity usually forbidden, shews that the Egyptians reached a higher point of delicacy and refinement than either their western or eastern contemporaries. Colossal in its art, profound in its philosophy and religion, and in possession of the knowledge of the arts and sciences, E. exhibits the astonishing phenomenon of an unexpectedly high and ancient civilisation. See Bunsen, *Aegyptens-Stelle*, 5 vols. 8vo, Hamb. and Goth., 1845—1857; Lepsius, *Denkmäler der Aegypten*, 12 vols. folio, 1849—1860; Rosellini, *Monumenti dell' Egitto e della Nubia*, 8vo and folio, Pisa, 1840; Sharpe, *History of Egypt*, 8vo, Lond. 1846; Brugsch, *Histoire d'Egypte*, 4to, Leip. 1849; Lepsius, *Königsbuch, der Alten Aegypter*, 4to, Ber. 1858; Wilkinson, *Manners and Customs of the Egyptians*, 6 vols. 8vo, Lond. 1847; Lane, *Modern Egyptians*, 2 vols. 8vo, Lond. 1842.

**EGY'PTIAN VU'LTURE** (*Neophron percnopterus*), one of the smaller *Vulturidæ*, of a genus differing from the true vultures in the slender bill, which is covered for more than half its length with



Egyptian Vulture and Young.

a naked cere, and sharply hooked at the point. The head and throat are naked, but feathers extend along the back of the neck to the crown. The E.V. is not much larger than a raven. The plumage of the male is white, except the great quill-feathers, which are black. This bird is plentiful in Egypt, where it renders important service—as also in Turkey, Syria, and other countries—in devouring and so cleansing away carrion from the vicinity of human abodes. It is constantly to be seen in the streets of towns, and seems to be aware that it is regarded with favour, and enjoys the protection of mankind. Europeans in Egypt often call it Pharaoh's Hen, or Pharaoh's Chicken. It follows caravans in the desert, to devour whatever dies. Numbers are often seen congregated together, but the E. V. is not truly gregarious, and lives generally in pairs. Its geographic range extends over the whole of Africa, and great part of Asia; it is common in many parts of the south of Europe, is an inhabitant of the Alps and the Pyrenees, sometimes visits more northern regions, and has been killed in England.

**E'HNINGEN**, a town of Würtemberg, situated 21 miles south-south-east of Stuttgart, is the rendezvous of a great number of pedlers who traverse the neighbouring districts for the purpose of disposing of their wares. Pop. about 5000.

**E'HRENBERG**, Christian Gottfried, one of the most distinguished naturalists of Germany, was born, 19th April 1795, at Delitsch, in Prussian Saxony. Although he had been originally intended for the clerical profession, he early relinquished the study of theology in favour of medicine; and after having attended the classes at the medical faculty at Leipsic for two years, he removed in 1817 to Berlin, where he graduated in medicine in 1818. His favourite study at this period was botany, and his earliest publications are devoted to botanical subjects, and more especially to such as demand the use of the microscope—an instrument with which the name and reputation of E. must ever remain inseparably associated; for to him belongs the merit of having rescued it from the discredit into which it had fallen, and of having been one of the first fully to appreciate its capabilities. In 1820, E. accompanied his friend Hemprich on his travels to the East; and after having visited Egypt, Syria, and Arabia, returned, in 1826, to Berlin, where he was appointed to one of the medical chairs of the university, which he still occupies. The three years which intervened before he again set forth on a scientific expedition, were devoted to the arrangement and classification of some of the abundant materials which he had accumulated in his eastern travels; and to this period belong the composition of his *Akalephen des Rothen Meeres*—which has largely contributed towards our knowledge of the Medusæ—and his *Symbolæ Physicæ*. In 1829, E. accompanied G. Rose and A. von Humboldt on an expedition to the Ural and Altai Mountains, in the course of which he collected materials for his numerous memoirs on the Infusoria, and for his great work, *Infusionsthierchen*, published at Leipsic in 1838, which have identified his name with the history and study of this department of animal life. E. divided the Infusoria into Rotatoria (now found to belong to higher orders of animal life) and Polygastrica, which correspond more nearly with the Infusoria as now admitted, although many of his polygastric organisms have been found to be vegetable structures, and some to be the larval forms of worms, &c. E.'s researches have not been confined to living organisms, but include fossil Infusoria; and his great work, *Mikrologie*, on the application of the microscope to geology, contains the results of his investigations in this department of inquiry. E. is a member of most of the scientific bodies of Europe, and has, for upwards of forty years, been an active contributor to the scientific literature of his country.

**EHRENBREI'TSTEIN** (Honour's Broad Stone), a town and fortress of Rhenish Prussia, is picturesquely situated on the right bank of the Rhine, directly opposite Coblenz, with which it is connected by a bridge of boats. The town of E. has several mills, a tobacco-manufactory, a flourishing trade in wine, corn, and iron, two cattle-markets, and four annual fairs. Pop. 4501. The fortress of E. occupies the summit of a precipitous rock 490 feet high, and has been called the Gibraltar of the Rhine, on account of its great natural strength, and its superior works. On three sides, the fortress is so precipitous as to be perfectly inaccessible; on the fourth and only approachable side, the north-west, it is fortified by three successive lines of defences, one within another. It is defended by 400 pieces of cannon; has cisterns capacious enough to hold a supply of water for three years, and a well sunk 400 feet deep in the rock, and having communication with the Rhine. E. was besieged in vain by the French in 1688, but fell into their hands in 1799, after a siege of fourteen months. Two years after, the French, on leaving E., at the peace of Luneville, blew up the works. It was assigned, however, to Prussia by the Congress of Vienna in 1814, and under that country was restored and thoroughly fortified. It is now one of the strongest forts in Europe. It is capable of accommodating a garrison of 14,000 men, and provisions for 8000 men for ten years can be stowed in its vast magazines. The view from the fortress, which comprehends a considerable portion of the course of the Rhine, including its confluence with the Moselle, is picturesque in the highest degree.

**EI'CHHORN**, Johann Gottfried, one of the most distinguished scholars produced by Germany, was born at Dörinzimmern, in the principality of Hohenlohe-Oehringen, in 1752, and studied at Göttingen. He first became rector of the school of Ohrdruff, in the duchy of Gotha, afterwards, in 1775, Professor of Oriental Languages in the university of Jena, and in 1788 removed to Göttingen in the like capacity. Of this university he continued a distinguished ornament till his death in 1827.

His scholarship was almost universal, and he has left numerous treatises on a multitude of subjects, both ancient and modern, classical and Oriental, but he is chiefly known in this country as a biblical critic, and a chief of what is called the rational school. E. examined the Scriptures from an anti-supernatural point of view, but applied to their elucidation and criticism an unrivalled knowledge of Oriental and biblical antiquities. Miraculous appearances recorded in the Bible are held by him to be explainable as natural events, and everything is to be brought to the test of reason. Rationalism in this form can hardly be said to exist now, even in Germany; but some of E.'s views as to the historical origin of the canonical gospels have been extensively adopted. His chief works on this subject are a Universal Library of Biblical Literature (*Allgemeine Bibliothek der Biblischen Literatur*, 10 vols. Leip. 1787—1801); an Introduction to the Old Testament (*Einleitung in das Alte Testament*, 4th ed. 5 vols. Gött. 1824); an Introduction to the New Testament (*Einleitung in das Neue Testament*, 5 vols. Gött. 1824—1827); and an blind royal pride and sincere Christian humility; heart-impulses struggling against habits of obstinate self-consciousness; true piety in the midst of misguided conduct; invincible, though somewhat inert devotion to his faith, his honour, and his rank; and as all these sentiments are expressed in monotonous language, which, though often emphatic, is always grave, tranquil, and even unctuous, with serenity and sadness, it is not surprising that such a work should have profoundly affected all royalist hearts, and easily persuaded them that it was the king himself who addressed them.'—Vol. i. p. 31.

**EI'LENBURG**, a town of Prussian Saxony, is situated on an island of the river Mulde, 26 miles east-north-east of Merseburg. It is reached by two bridges, is surrounded by walls and ditches, and consists of the town proper with four suburbs. The manufactures of E. consist of calico, woollen yarn, tobacco, starch, vinegar, and brandy. Pop. about 9900.

**EILETHY'IA**, a city of Egypt, anciently Nuben, and known at present by the name of El Kab. The town was anciently walled. The present ruins consist of the remains of small temples dedicated by Rameses II. to Ra; a Ptolemaic temple dedicated to the Eponymous goddess by Physcon or Euergetes II., with additions by Ptolemy Alexander I., and Cleopatra; and another temple dedicated by Amenophis III. to the local deities. The names of other monarchs are also found in the ruins; but the most interesting and important remains are the rock-tombs excavated in the vicinity. That of Aahmes-Pensuben, a functionary, records his military services in the wars of the early monarchs of the 18th dynasty against the Shos or Shepherds, and other Asiatic and Nigritic races. Another, of Pahri, is decorated with paintings representing the pursuits of agriculture. Swine were sacred to the local goddess. The town itself, during the 18th dynasty, appears to have been governed by princes, and some of the tombs appear as late as the 19th and 20th dynasties.—Wilkinson, *Modern Egypt*, vol. ii. p. 270; Champollion, *Notice Descriptive*, p. 265; Brugsch, *Reiseberichte aus Aegypten*, p. 214.

**EI'MBECK**, or **EI'NBECK**, an old town of Hanover, is situated on the Ilme, forty miles south-south-east from Hanover, in lat. 51° 49′ N., long. 9° 50′ E. It was a place of considerable importance in the 15th c., but has decayed greatly in recent times. It is surrounded by old ruinous walls, which are entered by five gates; its houses are antiquated; its streets narrow, tortuous, and badly paved. One portion of the town, however, which was burned down in 1826, has been rebuilt in a greatly improved manner. E. has manufactures of woollens, cottons, and linens, and chemical products; and has distilleries, breweries, tanneries, and tobacco-factories. E. owes its origin to the pilgrimages made to the Chapel of the Holy Blood, founded here in 1094 by Count Alexander von Darul. Pop. 5000.

**EI'MEO**, one of the Society Islands, in the Pacific Ocean, lies in lat. 17° 30′ S., and long. 150° 10′ W., about 30 miles to the west-north-west of Tahiti, the principal member of the group. It measures nine miles by five, and numbers about 1200 inhabitants. It consists of deep valleys and abrupt hills—the former well cultivated, and the latter heavily timbered. It is worthy of notice chiefly as the cradle of Polynesian Christianity. Here, in or about 1814, occurred the first popular manifestation in favour of the new religion; and here was established, as an instrument of evangelisation, the South Sea College of the London Missionary Society.

**EINSIEDELN**, a small town of Switzerland, in the canton of Schwytz, and 9 miles north-north-east of the town of that name. It is worthy of mention on account of its Benedictine Abbey, containing a black image of the Virgin, to which about 150,000 pilgrims annually repair. The town has 55 inns and 20 alehouses, supported chiefly by the pilgrims. The dedication festival of the abbey, 14th September, is the great pilgrimage season. The present abbey, one of the finest in Switzerland, was built at the beginning of the 18th c., and is the fifth since the foundation of the abbey, in the 10th century. Its treasury was rifled by the French in 1798. Pop. about 3000.

**EIRE, EYRE**, JUSTICES IN (corruption of Lat. *in itinere*). By this term, both in England and Scotland, were the judges of Assize (q. v.) formerly designated. Justices in eire were first established in England by the statute of Northampton (1176 A.D.), in the reign of Henry II. At first, they made the circuit of the kingdom once in seven years; but by Magna Charta, c. 12, the chief-justices are directed to send justices through every county once in the year. In Scotland, the chief-justiciar, says Erskine, i. 3, s. 25, was originally bound to hold yearly two justice courts or aires at Edinburgh and Peebles. This court gradually became fixed at Edinburgh. Besides this court, special 'justice-aires' were frequently held in the more remote parts of the country by the king in person, or by judges named by him, twice in the year, in spring and autumn (st. Robert III. c. 30, 1440 c. 5, 1491 c. 29). These courts were discontinued, but revived by 1587, c. 81. The term is still in use in Scotland, where, at the commencement of every circuit, proclamation is made to the lieges to attend the 'circuit eire.'

**EI'SENACH**, a town of Germany, Saxe-Weimar, is beautifully situated amid finely wooded hills on the Hörsel, 45 miles west from Weimar. It is a prosperous and industrious town, is surrounded with walls, which are pierced by five gates, and is well built, with wide, clean, and well-paved streets. E. has a ducal palace, a large and handsome building, now used as a court-house; a spacious market-place, including a handsome civic school; numerous churches; and a school of design. Its manufactures are woollen, cotton, and linen goods, soap, white-lead, meerschaum pipe-bowls, leather, and carpets; there are also breweries and tanneries, and oil, powder, and spinning-mills. Pop. 10,000.

On a lofty eminence in the immediate vicinity, surrounded by forests, stands the castle of Wartburg, now used as a prison, but formerly a residence of the landgraves of Thuringia, and worthy of notice as the spot where the Minnesingers (q. v.) assembled to hold a trial of skill in 1207, but chiefly as being the asylum to which Luther, at a time of great danger, was carried by his friend the Elector of Saxony, who, waylaying the great reformer, seized him, with an appearance of violence, and hurried him to this fastness, where he remained in safety from May 1521 to March 1522. The chapel in which Luther preached, as well as the chamber which he inhabited, and in which he discomfited the Evil One by throwing the inkstand at his head, is still pointed out. Another portion of the castle contains a fine armoury, with suits of the 16th and 17th, and even, it is said, of the 13th and 14th centuries.

**EI'SENBERG** (Ger. Iron Mountain), a small town of Germany, in the duchy of Saxe-Altenburg, is situated on an eminence near the Saale, 26 miles east of Weimar. It is well built, its chief edifices being the castle, the observatory, the lyceum, and the town-house. E. has manufactures of woollens, porcelain, and earthenware, and has five annual fairs. Pop. 5000.

**EI'SENERZ**, a small town of Austria, in the north of the province of Styria, 20 miles west-north-west of Bruck. Its appearance is dirty and unprepossessing, and it is worthy of mention only for its connection with the Erzberge (ore mountain), at the southern base of which the town lies. This mountain, which is about 2840 feet high, and about five miles in circumference at the base, is literally a solid mass of iron ore, of a quality so rich, that, instead of cutting mines into it and following the metal in veins—which process was formerly adopted here—the top and sides of the rock are quarried from the outside, and the ore is then broken small, and conveyed to the smelting-house without further preparation. Mines have been worked on this mountain for upwards of 1000 years. Arragonite (*Eisenblüte*, or *Flos ferri*), resembling branching coral in form, and of the most beautiful and purest white, is found in grottos in the interior of the mountain. Nowhere else does it occur in equal perfection. E. has 12 smelting-houses, 3 furnaces belonging to government, and a population of 3300, employed in mining.

**EISENSTADT**, a free town of East Hungary, stands in lat. 47° 50′ N., and long. 16° 30′ E., 12 miles north-north-west of Oedenburg. It is a walled town, has two gates, and consists principally of three main streets. It has also a Franciscan monastery, containing the burial-vault of the Esterhazy family, who are the proprietors of the palace, which forms the chief architectural feature of Eisenstadt. This palace was built in 1683, but was altered and enlarged in 1805. It contains 200 chambers for guests, and has a saloon sufficiently large to dine 1000 people. Its library contains a magnificent collection of church-music—masses, litanies, oratorios, &c., with some of Handel's MSS. In the suburbs is a conservatory, one of the largest in Europe, containing 70,000 specimens of exotic plants. Pop. 5700.

**EI'SLEBEN**, a town of Prussian Saxony, is situated about 25 miles north-west from Merseburg, in lat. 51° 33′ N., long. 11° 35′ E. It consists of the Old Town—which is surrounded by walls and ditches, and has seven gates—the New Town, and the suburbs. E. has manufactures of potash and tobacco; in the vicinity are copper and silver mines, and smelting-works. Pop. 10,285. Here, on the 10th November 1483, Luther was born, and here also he died, 16th February 1546. The house in which he was born was partially consumed by fire in 1689. An interesting remnant of it, however, is still extant, having the portrait of Luther placed over the entrance. In the church of St Andrews are the cap, cloak, and other relics of the great reformer.

**EISTEDDFODS**, the name given to the gatherings of Welsh bards for competition in national minstrelsy. See BARD, and WELSH LANGUAGE AND LITERATURE.

**EJE'CTMENT**, ACTION OF (*Ejectio firmæ*), in English Law, 'is a possessory action, wherein the title to lands and tenements may be tried, and the possession recovered, in all cases where the party claiming title has a right of entry.'—Selwyn's *Nisi Prius*. 'The action of ejectment,' says Lord Mansfield, 'is the creature of Westminster Hall, introduced within time of memory, and moulded gradually into a course of practice by rules of the courts.'—*Fairclaim & Fowler* v. *Shamtitle.* 3 Burr. 1292. According to the strict rules of common law, a person dispossessed of his property in land, &c., was obliged to enforce his right by means of one of the forms of real Action (q. v.) now abolished. But as the form of action differed according to the nature of the possession of the holder of the land, this process was tedious and inconvenient. In order to remedy this defect, the action of ejectment was by degrees adopted as a means of establishing a title to land. This action was at first applicable to the special case where the plaintiff was lessee for years, and it was limited originally to a demand for damages simply. But it is said that as early as the reign of Richard II. or Edward IV., the court gave judgment that the plaintiff should also recover the term and the possession of the land. The action having thus acquired in some measure the character of a real action, it was found convenient to extend its effect. By means of a legal fiction, introduced in the time of Henry VII., the action was first applied to the purpose of enforcing a title to land. The process adopted was as follows: The judges having declared that a tenant for years succeeding in his action should have possession, the claimant of the land commenced by feigning a lease for years granted by himself to an imaginary lessee, John Doe. It would seem that at first the plaintiff actually granted a formal lease to a friend, who was also formally ousted, in order to raise the question of title. But these men of straw being removed as the cause proceeded, it was soon found that they might be altogether dispensed with, and the fictitious John Doe and Richard Roe substituted in their room. The declaration proceeded to state that upon this lease Doe entered, and that Richard Roe, also an imaginary person, had ousted him. Notice of this action was then given to the actual tenant of the lands, together with a letter from the imaginary Richard Roe stating that he should make no appearance to the action, and warning the tenant to defend his own interest. If no appearance was made, judgment was given in favour of the plaintiff, who thereupon became entitled to turn out the tenant in possession. But if the latter made appearance, the first step in the action was a formal acknowledgment by him of his possession of the lands, of the lease in favour of Doe, of Doe's entry, and of the ouster by the tenant himself. These matters, be it remembered, were, in fact, mere fictions; but having been introduced on the record simply to comply with the technical rules of legal title, they were equally readily removed when the real question at issue presented itself. This reduced the cause to the simple question of the right of the plaintiff to grant the lease to Doe, and thus the title to the land became the real question at issue. But it must be observed that this remedy was confined to the case of one having a Right of Entry (q. v.). Where, therefore, a person had suffered a Deforcement or Discontinuance (q. v.), he was still obliged to resort to a real action to establish his right. This state of things continued till 3 and 4 Will. IV. c. 27, whereby the remedy by ejectment was, with a few exceptions, in fact extended to every one who alleged that he was wrongfully dispossessed; but it was at the same time provided that no action should be brought to recover land but within twenty years after the right accrued. But while the remedy was thus extended, the same elaborate string of fictions was suffered to continue until the passing of the Common Law Procedure Act (15 and 16 Vict. c. 76), whereby the ancient machinery is quite swept away. The action now commences by a simple writ addressed to the tenant in possession, and 'to all persons entitled to defend the possession,' setting forth that the plaintiff has asserted a claim to the land, and calling upon those interested to appear within a certain time to defend their right. The writ also contains a notice that, in default of appearance, the tenant in possession will be ejected. On appearance being made, issue is joined, and the cause proceeds as in ordinary actions. Judgment in ejectment will not carry the mesne profits, to recover which a supplementary action is necessary; for particulars of which, see Trespass Quare Clausum Fregit.

**EJOO.** See Gomuto.

**EKATERINBU'RG**, a fortified town in the west of Asiatic Russia, is situated on the eastern slope of the Ural Mountains, on both banks of the Isset, in lat. 56° 50′ N., long. 60° 7′ E. It is a well-built town, its streets long and straight, but unpaved. As a substitute, however, planks are laid along the sides of the streets, and used as footpaths. The majority of the houses are of wood, but there are also many very handsome stone buildings. In the southern portion of the town, which is connected with the northern by a fine bridge, are the government magazines, the mills, factories, and the market-place. The opposite side, however, is the handsomer. It contains the dwellings of the mine-proprietors and of the merchants, and is laid out in elegant and spacious streets. E. is the seat of administration for the Ural mines, and is in the centre of the mining districts of these mountains. Among its institutions, it has a museum of mineralogy, an excellent chemical laboratory, a school for educating miners, an imperial mint, numerous works for cleansing and amalgamating metals, and for cutting and polishing precious stones. The greater number of the inhabitants are supported by the productiveness of the neighbouring mines. E. stands on the high road between Russia and Siberia, and is therefore a place of brisk trade. In the vicinity are the gold-mines of Niviansk and Beresoff. Pop. 16,497. E. was founded by Peter the Great in 1723. Its average temperature during the year is 31° 9′.

**EKATERINODA'R**, a town of Russia, and capital of the country of the Cossacks of the Black Sea, is situated on the right bank of the river Kuban, about 100 miles from its mouth, in lat. 45° 5′ N., long. 39° E. It is surrounded on all sides by swamp and morass. Its houses are almost all of earth, have thatched roofs, and are of one story in height. The streets are broad, regular, and straight, but exceedingly dirty. E. has a cathedral with six wooden towers, and a wooden fortress. Pop. estimated at 9000.

**EKATERINOGRA'D**, a town and fortress in the south of Russia, in the government of Caucasus, is situated on the left bank of the Terek, in lat. 43° 40′ N., and long. 44° 3′ E. It is an important military post of the Cossacks; its houses are regular, but miserably built. A stone triumphal arch was erected at E. by Catharine II., in memory of Prince Potemkin, who founded the town in 1777. Pheasants abound here, and form a principal article of food. Pop. 5000.

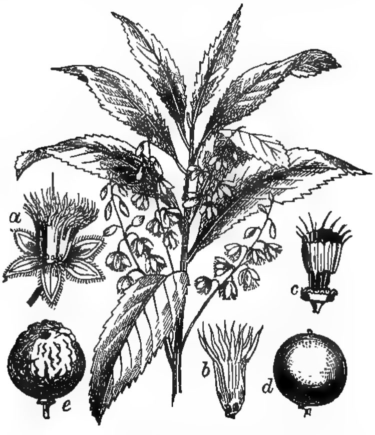
**EKATERINOSLA'V**, a government of Russia, in the province of South Russia, bounded on the N. by Little Russia, and on the S., reaching in one part to the shores of the Sea of Azov. The government of E., together with that isolated portion of it which lies on the eastern border of the Sea of Azov, and comprises the district of Taganrog and the country of the Azovian Cossacks, has, in all, an area of 25,319 square miles, and in 1856 had 1,039,597 inhabitants. Only about one-third of the entire area consists of cultivable land, the remainder being desert (see Steppe). The climate is mild, and a great many highly esteemed fruits, as apricots, peaches, cherries, &c., which do not occur in the more northern parts of Russia, are found here. Agriculture is pursued, but the quantity of grain produced is not equal to the consumption. Cattle-grazing is extensively carried on. The chief town is Ekaterinoslav.

**EKATERINOSLAV**, a fortified town of South Russia, is situated on the right bank of the Dnieper, 250 miles north-east from Odessa, in lat. 48° 27′ N., long. 35° 5′ E. It was founded in 1787 by the Empress Catharine II. The streets are long and broad, but not so clean or so well filled with houses as they might be. E. has manufactures of silk and woollen goods, and an important annual wool-fair. It is the residence of an archbishop. In the vicinity is a palace, now in a ruinous condition, but formerly the residence of Prince Potemkin. Pop. 13,000.

**ELÆA'GNUS**, a genus of exogenous plants, of the natural order *Elæagnaceæ*. This order consists of trees and shrubs, usually covered with scurfy scales, and having alternate or opposite entire leaves, without stipules. There are only about thirty known species of this order, all natives of the northern hemisphere, but found both in its warm and cold regions. The Sallowthorn (q. v.) is the only British species. *Shepherdia argentea*, a North American shrub of this order, yields a pleasant fruit. The genus *Elæagnus* consists of a number of deciduous shrubs or low trees, with male and female flowers on the same plant. *E. angustifolia*, the Oleaster, sometimes called Wild Olive, is a native of the south of Europe and the Levant, a spiny tree of 15—20 feet in height, with lanceolate leaves, which, as well as the young shoots, are hoary with stellate hairs. It is frequently planted in England, for the sake of its silvery white foliage, beautifully contrasting with the green of other trees, and its very fragrant flowers, which are small and of a dull yellow colour.

**ELÆ'IS.** See Oil Palm.

**ELÆOCARPA'CEÆ**, according to some botanists, a natural order of exogenous plants, but regarded by others as merely a sub-order of *Tiliaceæ*; the chief distinctions being deeply cut or fringed petals and anthers opening at the apex. The E. are mostly East Indian trees. The fruits of some are eaten; those of some are dried and



Elæocarpus Cyaneus:
*a*, magnified flower; *b*, petal; *c*, stamens; *d*, ripe fruit; *e*, same cut away, shewing wrinkled seed.

put into curries; those of *Elæocarpus serratus* are pickled in brine and eaten with oil in Ceylon, and much resemble olives. *E. cyaneus*, a native of New Holland, is here figured. The deeply wrinkled seed or stone of the fruit of some, particularly *Elæocarpus ganitrus* and *Monocera tuberculata*, being very hard, and having a fine sculptured appearance, are made into beads for necklaces and bracelets, and are sometimes set in gold. They are often called Olive Nuts. These beads are frequently worn by religious devotees in India, and are sometimes sold as ornaments in the shops of Europe.

**ELÆOCO'CCA**, a genus of *Euphorbiaceæ*, the seeds of some of which yield useful oils. The oil obtained from *E. verrucosa* is used for food in Japan, notwithstanding considerable acridity. The tree is cultivated in the Mauritius, and the oil is there used only for burning. That obtained from *E. vernicia* is used in painting in China.

**ELÆODE'NDRON**, a genus of trees of the natural order *Celastraceæ*, having a 5-partite calyx, 5 petals, a 5-angled disc, 5 stamens, the ovary immersed in the disc, and a drupaceous fruit. *E. glaucum*, a native of Ceylon and the south of India, is sometimes called the *Ceylon Tea-tree*, from the resemblance of its leaves to those of the tea-shrub. The timber of *E. croceum*, called Saffron-wood at the Cape of Good Hope, is much used there in building and cabinet-making; it is fine-grained, hard, and tough. The fruit of *E. Kubu*, another South African species, is eaten by the colonists. That of *E. Argan* yields an oil similar to olive oil, much used by the Moors.

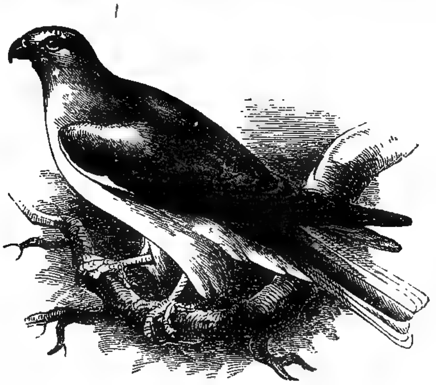
**ELAGABA'LUS**, or **HELIOGABA'LUS**, emperor of Rome, was born at Emesa in 204 A.D. His real name was Varius Avitus Bassianus, but having, when a mere child, been appointed high-priest of the Syro-Phenician sun-god Elagabal, he assumed the name of that deity. Soon after the death of his cousin Caracalla, E. was proclaimed emperor by the soldiers, in opposition to the legitimate sovereign, Macrinus, who had become obnoxious to the troops from the severity of his discipline. The rivals met in battle at Antioch in 218 A.D. Macrinus was defeated, and E. quietly assumed the purple. His reign, which lasted rather more than three years and nine months, was infamous for the nearly unparalleled debaucheries of every kind in which he indulged. He was murdered in an insurrection of the prætorians in 222 A.D., and was succeeded by his son, Alexander Severus.

**E'LAND** (*Antilope Oreas*), a species of antelope, abounding in South Africa, wherever there are fertile plains and low hills, except in the longest settled and most cultivated parts of Cape Colony, where it has been too much hunted to be any longer of very frequent occurrence. It is described by Livingstone as 'the most magnificent of all antelopes.' It is one of those which are sometimes called *bovine* antelopes, because they seem to approximate a little in some of their characters to the ox-tribe, having a broader muzzle, less slender limbs, and greater bulkiness of form than the antelopes in general. The E., however, is a very graceful and beautiful animal; it is as large as a horse, fully five feet in height at the shoulder, and weighs from seven to nine cwt. The horns—which in the male are about a foot and a half long, and in the female longer and more slender—are almost straight, inclining backwards and outwards; they are pointed, and their great strength is increased by a spiral wreath. The E. has a large protuberance on the larynx, in this resembling the elk, from which, probably on this account, it has derived its name. It is also known as the *Impoof* or *Impoofoo*. Its tail very much resembles that of an ox, and terminates in a tuft of long black hair. It is a gregarious animal, and the herds are often large. It is generally very fat, and not difficult of pursuit, its gentleness also increasing the facilities of the hunter. Its flesh is very much esteemed, particularly the muscles of the thighs, which are dried like tongues. It is surprising that no attempt has been made to domesticate, for useful purposes, an animal very easy of domestication, and possessing so many valuable qualities.

Eland (*Antilope Oreas*).

Livingstone discovered a variety of the E. in regions to the north of the Cape Colony, having the body marked with narrow white transverse bands. According to the figure given in his travels, it seems even more bovine in form than the common variety.

**E'LANET** (*Elanus*), a genus of *Falconidæ*, allied to the Kites, which they resemble in many of their characters; but from which they differ in having the short tarsi half covered with feathers, and the claws, except that of the middle toe, rounded beneath. The tail is very little forked. One species (*E. melanopterus*) is common in Africa, from Egypt to the Cape of Good Hope, and is found also in India. Another species is the Black-shouldered Hawk (*E. dispar*) of America, the northern limit of which appears to be South Carolina. Both of these feed chiefly on insects, which they catch on the wing, but they also prey on small birds and reptiles.


Elanet (*Elanus dispar*).

**ELAPS**, a genus of venomous serpents, inhabiting the warm parts of the world, and chiefly the Indian islands, New Holland, and tropical America. They are of slender and cylindrical form, with an elongated head, and often of bright and beautiful colours. They are not very agile, are said to prey chiefly on other reptiles, and live among the luxuriant vegetation of meadows or of forests.

**ELASTIC TISSUE**, known also as Yellow Fibrous Tissue, is one of the forms of Fibrous Tissue (q. v.). It derives its name from the remarkable physical property which it possesses of permitting its fibres to be drawn out to double their length, and again returning to their original length. It occurs in various ligamentous and other structures of the animal body in which elasticity is required, as, for example, in the vocal chords, the membranes connecting the cartilaginous rings of the trachea, the middle coat of the arteries, the skin, &c.

**ELASTI'CITY**, or **SPRING**. When an external force acts upon a solid body, it produces at first slight alterations in the relative positions of the particles; and if before these alterations exceed a certain limit, the force ceases to act, the particles return to their former position, and the disfigurement disappears. This power or property of recovering their previous form after alteration, is called elasticity, and we are justified in ascribing it to all bodies, though in very different degrees. It was once believed that there were definite limits within which changes of form produced by pressure or other forces disappeared completely. It was thought, for instance, that when a weight of no great magnitude is suspended from a metallic wire, the slight increase of length which the wire is observed to undergo, is completely lost when the weight is removed; and the limit to which the wire might thus be stretched, and still suffer no permanent increase of length, was called the limit of its elasticity. But recent more accurate experiments have shewn that no such limits exist, at least in the case of metals; or, which is the same thing, that permanent lengthening results, however slightly the wire be loaded—it never contracts again quite so far as it was stretched. It is necessary, therefore, to fix the limit arbitrarily; and this is done by agreeing that it shall be held to begin when the metal in question suffers a permanent elongation of 0·00005 of its length. To get the elastic extensibility of a wire, then, we must compare its length with a weight suspended, with its length when the weight is removed. In this way it is found that the extensions produced are proportional to the extending forces or weights. From this law, then, we can calculate what weight it would require to stretch a wire or rod of a square inch in section to double its own length; supposing it possible to proceed so far without breaking it, and that the law of elasticity continued up to this point unaltered. This weight, which is different for every metal or kind of wood, is called the *coefficient* or *modulus of elasticity* of the particular substance; and is used in mechanics in calculating how far a given weight will extend a wire or rod of given diameter. This coefficient is not constant for the same metal; for all circumstances that increase the density of the metal, increase the modulus of elasticity. Bodies manifest elasticity not only when extended in length, but also when compressed, when bent, or when twisted. If an ivory ball be dropped from a height upon a marble slab smeared with fat and lampblack, when caught after the rebound, it is seen to have touched the marble, not in a point, but in a circle of several lines in diameter; and must therefore have lost for a time its spherical shape over that extent. In the same way the mark of a well hit golf-ball is pretty broadly shewn upon the face of a club after the stroke. The elasticity shewn by wires and threads of glass when twisted, has been turned to account in the Torsion-balance (q. v.), for measuring other weak forces. Steel, ivory, caoutchouc, &c., are well known for their elastic properties, to which they owe much of their utility.

The propagation of waves of sound through solid bodies depends upon their elasticity; and from observations of this kind made with different substances, the modulus of elasticity for each may be deduced; the results, however, differ slightly from those arrived at by attaching weights, owing to the heat produced by the vibratory movement.

All solid bodies are only imperfectly elastic—that is, they do not quite recover their form and volume when the disturbing force ceases. Liquids and gases, on the contrary, are perfectly elastic, or return exactly to their original bulk or volume when the pressure is removed. The elasticity of liquids and gases, however, acts only in expanding after compression, while that of solids acts also in contracting after extension. The expansive elasticity of liquids and gases is equal to the force used to compress them. Water and other liquids are easily seen to be compressible, by the fact of their conveying sound—a sound-wave being merely a *state* of compression, propagated from each layer of the liquid to the next. The coefficient of elasticity of water determined by Colladon and Sturm, from the velocity of sound in the Lake of Geneva, agrees very well with that determined by direct measurements in Oerstedt's apparatus. The discovery of the compressibility of water is an English one, due to Canton, in 1762. Previous attempts, by Italian and Dutch philosophers, to compress water by hammering a silver shell filled with that fluid, had failed to give any certain result, as the water was forced through the pores of the metal. At a temperature of 50°, one atmosphere compresses water to about 0·999995 of its volume. From the existence of a maximum density temperature for water, some curious consequences arise with regard to the effects of pressure on the fluid. The volumes or bulks which a given quantity of any gas assumes under different pressures, are nearly in inverse proportion to the pressures. See MARIOTTE'S LAW. The elasticity of gases is usually measured by the height of the column of mercury that they sustain. The elasticity of gases is a force much and variously employed in the arts of life. See AIR-GUN, AIR-PUMP, GUNPOWDER, &c.

**E'LATER**, a Linnæan genus of coleopterous insects, now divided into many genera, and forming the tribe or family *Elateridæ*. They have a narrow elongated body; the head is in almost all cases inserted deeply into the thorax; a strong spine on the under part of the thorax at its base, fits into a groove; the legs are short, and rather slender. They are generally found upon the flowers and leaves of plants, which are their food. When disturbed, they fold their legs and antennæ close to the body, and let themselves drop to the ground. If they fall on their back, or are placed on it, the shortness of their legs incapacitates them for obtaining another position by the means common to other insects; but they are enabled to do so by a violent muscular exertion, arching the body a little, and suddenly straightening it again, so that they fling themselves into the air with a jerk and a *click*. Hence the names CLICK-BEETLE (q. v.) and SKIP-JACK. The spine and groove of the thorax are supposed to be of use in this. The larvæ are long, rather slender, with six feet near the head, and a tough skin. Many feed on rotten wood; others, Wire-worms (q. v.), on the roots of plants. Many are British. Some of the *Elateridæ* of tropical regions diffuse from spots on the thorax a strong and beautiful light, and are called Fire-flies (q. v.).

**ELATE'RIUM**, a drug obtained from the fruit of the Squirting Cucumber, or Spirting Cucumber (*Ecbalium agreste*, formerly known as *Momordica Elaterium*), also called the Wild Cucumber, an annual plant of the natural order Cucurbitaceæ, a native of the south of Europe, common on rubbish in the villages of Greece and the Archipelago. The whole plant is rough, with stiff hairs; it has a trailing branching stem, without tendrils; the leaves are heart-shaped, somewhat lobed and toothed, on long stalks; the flowers axillary, yellow, the male flowers in small racemes; the fruit oblong, about an inch and a half long, grayish green, covered with soft prickles, and finally parting from its stalk, and expelling its seeds along with a thin mucus through the aperture where the stalk was inserted. This remarkable phenomenon is ascribed to osmotic action within the fruit; a thin membrane separating a mucus which immediately surrounds the seeds from a less dense juice which abounds in the succulent part of the fruit, and the quantity of the former being gradually increased at the expense of the latter, till, on the perfect ripening of the fruit, the much distended central cell is opened, to permit its ejection. It is this mucus surrounding the seeds—a thick green mucus of a very peculiar character—which contains the elaterium. To obtain the drug, the juice of the nearly ripened fruit is allowed to stand for a short time, when it becomes turbid, and deposits a sediment. The sediment, carefully collected and dried, is elaterium. It is of a pale grayish-green colour, light and friable, with an acrid taste, and a peculiar not unpleasant odour. It is an exceedingly powerful or drastic purgative, used chiefly in dropsies, and in very small often-repeated doses. It should not be used except under medical advice. It acts as an irritant not only on the eyes, if it comes in contact with them, but even on the fingers of those who handle it. Its properties seem to depend chiefly on a crystalline principle called *Elaterin*. The use of E. was known to the ancients. A few acres of the Squirting Cucumber are grown at Mitcham, in Surrey.

Wild Cucumber (*Ecbalium agreste*).

**ELATMA.** See Jelatom.

E'LBA (Lat. *Ilva*, Gr. *Æthalia*), an island belonging to the kingdom of Italy, in the Mediterranean Sea, between Corsica and the coast of Tuscany, from the latter of which it is separated by the channel of Piombino, a strait 5 miles in breadth. Its greatest length is about 18 miles, and its breadth varies from 3 to 10 miles, this irregularity being caused by indentations both on its northern and southern shores. Its area is about 97 square miles. The coast is bold and precipitous. The surface is traversed from west to east by a chain of mountains, which divides into two spurs at the eastern extremity of the island; the highest summit, Monte della Capana, attaining an elevation of 3600 feet above sea-level. These mountains are for the most part bare; but on their lower ridges, and in the valleys, the vine, olive, mulberry, and other trees flourish. The climate, except in the low-lying districts on the shore, is temperate and healthy. There are few streams in E., but it has numerous wells. The principal products are wines, white, red, and sweet, and of good quality; wheat, Indian corn, vegetables, and water-melons. 50,000 cwts. of salt are produced annually from the salt-pans on the shore. Sheep, goats, pigs, and asses abound, but horned cattle and horses are scarce; the coasts supply fish plentifully. Iron of excellent quality is obtained from a mountain in E., 2 miles in circumference, and 500 feet in height. This hill, which stands on the east coast, is almost entirely a mass of ore, and so rich that it yields from 50 to 75 per cent. E. also yields loadstone, alum, vitriol, and marble. Porto Ferrajo, the capital and residence of the governor, has a population of about 3000. E. has been rendered famous in history from having been Napoleon's place of exile from May 1814 till February 1815. Pop. 21,604.

ELBE (called by the Romans *Albis*—i. e., white—and by the Bohemians *Labe*), an important river of Northern Europe. It originates in the confluence of numerous streams which rise at the south-western base of the Schneekoppe (Snowcap), one of the highest summits of the Riesen-Gebirge, a mountain-range on the northern border of Bohemia. The course of the E. begins near lat. 50° 45′ N., long. 15° 36′ E.; at an elevation of about 4400 feet above sea-level. Its total length, including windings, is estimated at from 600 to 700 miles, and its basin at 58,800 square miles. The average depth of the E. is 10 feet, and its mean breadth 900 feet, although occasionally it has a width of upwards of 1000 feet, and at its mouth of several miles. In the course of its progress to the sea, it is joined by 17 rivers and upwards of 70 streams. From the base of the Schneekoppe, it flows south to Pardubitz, whence it proceeds west to Brandeis, and afterwards in a general north-west direction past Melnik, Leitmeritz, Aussig, and Tetschen, where it quits the Bohemian territory, and enters Saxony. At this point, it is 355 feet wide. Its principal affluent in Bohemia is the Moldau. On its course north-west through Saxony, the E. passes Pirna, Dresden, and Meissen, and entering Prussian Saxony, about seven miles above Mühlberg, it advances to Torgau and Wittenberg, from which point it flows first west, then north-west to Magdeburg, receiving in its progress the Mulde and the Saale, both from the left. From Magdeburg flowing north-east, the E. arrives at the border of Brandenburg, receiving the Havel from the right; then turning north-west, it forms the boundary between Prussian Saxony and Brandenburg, and enters Hanover, through which it flows for upwards of 30 miles. Then still flowing north-west, it forms the boundary of Lauenburg, the Hamburg territory, and Holstein on the north, and Hanover on the south, until it empties itself into the North Sea at Cuxhaven, where it attains a breadth of upwards of 10 miles. At this point, the tide rises 12 or 13 feet. The E. is divided into several branches between Hamburg on the north, and Harburg on the south, by the numerous islands that there interrupt its course. Vessels of 14 feet draught can at all times ascend to Hamburg. The scenery of the valley of the E., although generally pleasing, is not remarkable in any portion of its course, except that which extends between Aussig and Dresden. Between these two towns, the course of the E. is generally between bold cliffs, and high natural battlements of rock; the banks covered with foliage, wherever a tree can support itself; and occasionally varied by a strip of green glade. It has been said that here the E. has all the variety of the English Wye, on a scale nearly as majestic as that of the Rhine. Its waters are stocked with abundance of highly esteemed fish; beavers likewise build in the stream. Steam-boats ply from Dresden up the river, and down as far as Meissen, as well as from Magdeburg to the sea. The navigation of the E. was formerly impeded by all manner of imposts and monopolies; and, what was quite as bad, sand was allowed to accumulate, so that vessels were often obliged to wait three or four weeks for want of sufficient water. Both of these kinds of impediments have, however, of late years been gradually removed, though much still remains to be done.

**E'LBERFELD**, the most important manufacturing town in Prussia, and one of the most flourishing in all Germany, is situated on both sides of the Wupper, an affluent of the Rhine, 16 miles east-north-east of Düsseldorf. Its site, in the narrow and hill-girt valley of the Wupper, is picturesque and healthy, but the town itself is poorly built, straggling, and irregular, with streets for the most part narrow and dirty. The more recently erected portion of the town, however, is well built, with here and there spacious and imposing buildings, in a high architectural style. E. is chiefly famous for its dyeing, bleaching, and printing establishments, also for its extensive and important manufactures of cotton, silks, tapes, ribbons, merinos, fancy woollen goods, velvets, &c. Bleach-fields occupy a great part of the environs of E., and of the banks of the Wupper, the waters of which are said to possess very valuable bleaching properties. At E., the well known dye, Turkey red, is imparted to yarns, at a cheaper rate, and with more clearness and firmness of colour, than at any other town in Europe. The patterns for the printed goods are designed at E., principally by French artists. E. supports an important establishment, in which young manufacturers and overseers are taught the management of the Jacquard-loom, pattern-drawing, &c. Pop. 54,000, among whom are 14,000 Catholics and 400 Jews. Adjoining E., and united to it by a bridge, is the large town of Barmen (q. v.), also the seat of extensive manufactures.

**ELBEUF**, or **ELBŒUF**, a manufacturing town of France, in the department of Seine-Inférieure, is delightfully situated in a picturesque valley on the left bank of the Seine, about 75 miles north-west from Paris. It was originally badly built, but it has recently been greatly improved. Large factories also have arisen rapidly; and a spacious market-place (*champ de foire*), adorned with rows of chestnut-trees, has been erected. The two principal public buildings of E. are the churches of St Etienne and St Jean-Baptiste, both containing fine specimens of richly painted glass. The factories of E. and the vicinity exceed 200 in number; these are for the most part worked by steam-power, and give regular employment to more than the half of the population. The manufactures are principally double-milled and waterproof cloth, flannel fabrics, billiard table-covers, and light woollens of every colour and description. E. has daily communication with Paris, Rouen, and Le Havre, by steamer. Pop. 17,959. E., which has been called the Leeds of France, had 80 cloth manufactories as early as the 16th century. In consequence of the revocation of the Edict of Nantes, the greater number of the cloth manufacturers emigrated; and it was not till after the Revolution of 1789, and more particularly since the separation of Belgium and France, that industry again began to flourish.

**E'LBING**, a considerable trading and manufacturing town in West Prussia, is situated in the midst of a fertile valley, on the navigable river of the same name, 34 miles east-south-east of Danzig, and 5 miles south of the south-western extremity of the Frische Haff, into which the Elbing flows. It is connected by a canal with the Nogat, the eastern arm of the Vistula. The town was formerly surrounded with walls and mounds, of which, however, there are now but few remains. Of the numerous churches, the most remarkable is the Marienkirche, erected in the 14th century. The gymnasium, founded in the year 1536, contains the town library, consisting of 18,000 volumes. There are likewise several well conducted educational and charitable institutions. The manufactures are chiefly linen and cotton cloths, leather, tobacco, soap, and vinegar. There are also oil manufactories, iron foundries, breweries, dye and print works. E. was founded about the beginning of the 13th c., by colonists from Lübeck and Bremen, who settled round the fortress erected by the German knights. After various vicissitudes, it was annexed to Prussia in 1772, and after a period of decline, has again risen to a thriving condition. The larger vessels unload at Pilau, which serves as the harbour of Elbing. Pop. 25,000.

**E'LBOW.** See ARM.

**ELBOW-PIECES**, in armour, or *coudières*, were the metal-plates used to cover the junction of the rere-brace and vant-brace, by which the upper and lower half of the arm were covered. They increased to an enormous size, as in the effigy of Sir Thomas Peyton, in Isleham Church, but again decreased to their normal size. An *Elbow Gauntlet* was a gauntlet of plate reaching to the elbow, adopted from the Asiatics in the 16th century.—Fairholt's *Costume in England*, p. 494.

**ELBU'RZ**, a lofty mountain-range that runs longitudinally along the entire southern border of the Caspian Sea. It frequently divides itself into subordinate parallel ridges, enclosing extensive and fertile valleys, many of which are well inhabited and carefully cultivated. The E. mountains are included in the Persian province of Ajemi. Demavend (q. v.), said to be 20,000 feet in height, is one of the highest summits.

**E'LCHÉ** (anciently, *Ilice*, or *Illice*), a town of Spain, in the province of Alicante, and 16 miles south-west of the town of that name, is picturesquely built on both sides of a steep ravine, near the Elda, a tributary of the Segura, and about two leagues from the sea. It has an Oriental appearance. The climate is eastern, winter is unknown, and around the town rises a huge encircling plantation of palms; the Arab alone is wanting to complete the likeness to an eastern city. E. is a flourishing town, is well built, its streets in general are wide and clean, and it has numerous squares and public walks. The church of Santa Maria is an imposing edifice, with a large dome, five gates, a famous organ, and a tabernacle made of precious marbles. The dates gathered from the palm-plantation around E. are exported from

Alicante; they are not so good as the Barbary dates, though sold as such. Its manufactures are linens, woollens, and cottons, brandy, wine, cigars, oil, soap, &c.; in these articles there is a considerable trade, as also in cattle, rice, and wool. Pop. about 18,000.

**E'LCHINGEN**, a village of Bavaria, on the left bank of the Danube, about eight miles north-east of Ulm. It is noteworthy as the scene of a battle fought on the 13th October 1805, between the French under Ney and the Austrians under Loudon, in which the latter were defeated. Ney's victory obtained for him the title of Duke of Elchingen.

**E'LDER**, an office-bearer in Presbyterian churches. The name is an exact translation of the Greek *presbyteros*, which occurs frequently in the New Testament, and from which the English word *priest* is derived. That the *presbyteroi* of the churches of the apostolic age were not *priests* in the special sense of that word, in which it denotes a person appointed to offer sacrifice on behalf of others, and to appear for them before God, is admitted by Protestants in general; but there remains much division of opinion as to the precise meaning of the term, and the bearing of the passages in which it occurs on the subject of church government. See BISHOP, INDEPENDENTS, and PRESBYTERIANISM. All are agreed, indeed, that *bishops* and all pastors of congregations are included among *elders* in the scriptural use of the term; but the ordinary use of it is now limited to Presbyterian churches, and in them it has become the usual designation of the office-bearers associated with the minister of each congregation in the care and oversight of the flock. The argument for this class of office-bearers will be found briefly stated in the article PRESBYTERIANISM. They exist in the greater number of the churches of the Reformation; and even in the Church of England, Bishop Burnet states that their introduction was only prevented by Queen Elizabeth's dislike to a proposal, in which, with Burleigh and others of her advisers, she saw danger of an abatement of her prerogative, 'since, if the concerns of religion came into popular hands, there would be a power set up distinct from hers, over which she could have no authority.' In some Protestant churches, elders are appointed only for a certain term of office; but more generally it is until death, resignation, removal from the bounds of the congregation, or deposition. The appointment of elders takes place variously: in the Established Church of Scotland, they have generally been nominated by the kirk-session (consisting of the minister and elders); in the other Presbyterian churches of Britain and America, they are elected by the congregation. In most of the churches of the continent of Europe, which have any kind of connection with the state, there is some regulation of the civil law or some interference of the civil authorities in this matter. The ordination of elders takes place in the congregation, but usually without imposition of hands; a difference between the mode of ordination of elders and ministers for which it is not easy to account, and which has certainly tended to produce a general impression that a greater difference of office subsists than the advocates of Presbyterianism admit. In the Established Church of Scotland, the elders have very generally discharged the functions of Deacons (q. v.), at least as much as those which, according to the theory of Presbyterianism, belong to their own office; an example which, until recently, was almost universally followed in other Presbyterian churches. According to the *Second Book of Discipline* of the Church of Scotland, it is the duty of elders to watch over the spiritual welfare of the people, to admonish, to visit the sick, to assist in the examination of persons seeking admission to the Lord's Table, &c. Elders, along with ministers, compose all the courts or assemblies of the Presbyterian churches, and have equal votes in all questions.

**ELDER** (*Sambucus*), a genus of plants of the natural order *Caprifoliaceæ*, consisting chiefly of shrubs and trees, with pinnate leaves, small flowers of which the corolla is wheel-shaped and 5-cleft, and 3-seeded berries. The wood of the young shoots contains a very large pith. The species are very widely distributed.—The COMMON E. (*S. nigra*), the *Bourtree* of the Scotch, is a native of Europe, the north of Asia, and the north of Africa. It is found in all parts of Britain. It is a very large shrub, sometimes a small tree, with rather large leaves, and large terminal cymes of cream-coloured flowers, which are followed by small black—or rarely whitish—berries. Its leaves and young shoots diffuse a narcotic odour, and it is said to be dangerous to sleep under its shade. The inner bark has a bitter acrid taste. The leaves possess the same properties in a rather milder degree. The flowers have a peculiar sweetish and rather sickening smell, but are much used for making a distilled water—*Elder Flower Water*—which has a very agreeable odour, and is employed both in perfumery and confectionary. Distilled with water alone, they yield a volatile oil, which, on cooling, assumes a buttery consistence. A popular cooling ointment is made by boiling them in lard. They are also used for imparting a flavour to currant-wine and jelly, being added at the time of a slight fermentation which takes place in the spring of the year, after the currant-wine is made; and a wine is made from them which in scent and flavour resembles Frontignac. The clustered flower-buds are pickled, and used like capers. A grateful wine, well known in England, especially about Christmas, is made from the berries; and in some parts of Kent there are large plantations of E. to supply the London market for its manufacture. It is generally drunk hot or *mulled*. The berries are subacid and sweetish, with a rather unpleasant flavour. A rob made from them is a gentle aperient, diuretic, and sudorific, easily administered to children. In some parts of Germany, the poorer people use them as an ingredient in soups. They are said to be used to no small extent in England in the adulteration of port wine, and the manufacture of spurious port wine.—

Flower-stock, Leaves, and cluster of Berries of Common Elder (*Sambucus nigra*).

The wood of the E. is yellow; that of old trees is very hard and tough, takes a fine polish, is used by turners, and as a substitute for box-wood in making mathematical instruments and other articles. Tops of fishing-rods are sometimes made of it. The pith of the young shoots being very light, is generally used to make pith-balls for electrical experiments. Toys for children are also made of it; and few boys are unacquainted with the use of E. branches, from which it has been expelled, for making pop-guns. The E. is very useful as a screen-fence near the sea and in other exposed situations, as it grows with remarkable vigour, and makes great shoots, the destruction of the more tender and less matured parts of which in winter only tends to make it more bushy and useful for shelter. It is readily propagated by portions of its shoots stuck into the ground.—The SCARLET-FRUITED E. (*S. racemosa*), a native of the south of Europe and of Siberia, much resembles the common E., but has softer and more herbaceous shoots, remarkably large buds, which are conspicuous in winter, and racemes of greenish-white flowers, which are followed by scarlet berries, the racemes of ripe fruit having much the appearance of beautiful pieces of coral. It is a frequent ornament of shrubberies in Britain, and when in full fruit, is almost unrivalled in beauty, but more frequently produces its fruit in cold districts than in those where the milder winter induces it to flower before the spring-frosts are over. The juice of its berries is a powerful sudorific. —The DWARF E., or DANEWORT (*S. Ebulus*), is a rather rare British plant, a coarse herbaceous plant, with fetid smell. The *inner bark* has been employed in dropsical complaints as a hydragogue cathartic, and is given in the form of a decoction prepared by boiling down 1 oz. of the bark in 2 pints of water till the whole is concentrated to 1 pint. The dose is about 4 fluid ounces. In smaller quantities, it is useful as an aperient in certain chronic disorders. The *flowers* are white when freshly plucked, but become yellow in drying, and consist of a volatile oil, certain gummy, resinous, albuminous, and saline matters, and are stimulant and sudorific. They are employed in the preparation of *elder flower water* by adding 2 gallons of water and 3 ounces of rectified spirit to 10 pounds of the flowers, and distilling off about 1 gallon. It is a good perfume. *White elder ointment* is procured by boiling equal weights of lard and elder flowers, and pressing through a cloth. It has an agreeable odour, and is employed as a cooling application to surfaces which are irritable. When the berries are expressed, they yield a purple juice named *elder rob*, which, when diluted with water, is useful in inflammatory and febrile complaints as a cooling drink. It contains malic and citric acids, sugar, gum, &c.

**E'LDON**, BARON, Lord High Chancellor of England. John Scott, better known as Lord Eldon, was born 4th June 1751, in Love Lane, Newcastle, of obscure but respectable parents. William Scott, his father, began life as an apprentice to a 'fitter,' a sort of water-carrier and broker in coal; later in life, he became a 'fitter' himself, and kept a public-house near the quay, to supply drink to his keelmen on the truck-principle; he engaged also in speculations in shipping and marine insurance. By his various occupations he became wealthy, and died worth about £20,000. John Scott's mother was a daughter of a Mr Atkinson of Newcastle, and to her, Lord Campbell, in his *Life of Lord Eldon*, traces the talent inherited by her sons William and John. William became Baron Stowell, and was the head for many years of the High Court of Admiralty. See STOWELL, BARON.

John Scott was educated under the Rev. Hugh Moises, at the grammar-school, Newcastle, and as a boy gave no promise of his subsequent splendid career. On finishing his education under Mr Moises, he, on the 15th May 1766, entered University College, with a view to the church; the following year he obtained a fellowship, and in the summer of 1771 won the prize for the English essay, but did not otherwise distinguish himself. A clandestine marriage, into which he entered with a Miss Surtees in 1772, nearly ruined him; however, by the advice of his brother, he returned with his wife to the university. Here, during the year of grace, he lived on his fellowship and gains as a private tutor; and the year expiring without a church living falling vacant, he betook himself to the study of law. In 1776, he was called to the bar. By this time, his wife's friends had become reconciled to her, and made her some provision; and by the death of his father, in the year of his passing at the bar, E. found himself in possession of £3000. On his own and wife's money, he found he could just manage to live, and so settled on the northern circuit. His success on his first circuit was not great; but in his second year his prospects, through the aid of his brother and friends, began to brighten. It was not, however, till 1780 that prosperity could be said to have dawned upon him. A happy chance then occurred of shewing both his talents and powers of work. The result was speedy affluence. Business poured in upon him; and by 1787 his practice at the equity bar had so increased, that he was forced to give up the eastern half of his circuit.

With success in his profession, E.'s ambition expanded, and he became political. A silk-gown, and then, through the favour of Lord Thurlow, a seat in parliament, were but steps towards knighthood and the post of Solicitor-general conferred on him by Pitt. From this point, his progress was secure, and effected much in the way in which political lawyers usually succeed. In 1793, he became Attorney-general. In 1799, the office of Chief-justice of the Court of Common Pleas falling vacant, his claim to it was not overlooked; and after 17 years' service in the House of Commons, he entered the House of Peers as Baron Eldon. In 1801, on the formation of the Addington ministry, E. ascended the woolsack—a post given to him nominally because of his great anti-Catholic zeal, but really because of his part in the intrigue which ousted his old patron Pitt from office. From this time till 1827, with little intermission, E. continued to occupy the woolsack under successive governments. He was in succession Chancellor under Addington, Pitt, and Lord Liverpool; and when, after the two brief administrations of Canning and Goderich, the Duke of Wellington constructed a cabinet, E. again expected the woolsack, and resented his non-appointment to it. His love of office indeed continued to the last, and in 1835, we find him actually in hopes of office under Peel. In 1834, he ceased to speak in parliament. In 1821, E. was made an earl by George IV.; and in the same year, his brother William was raised to the peerage under the title of Lord Stowell. In 1831, he lost by death his wife, his 'beloved Bessy.' His brother William died in 1836. He himself, after outliving almost all his immediate relations, died in his 87th year, January 3, 1838, leaving behind him a fortune of over half a million sterling.

E. is said to have been a man of very winning and courtly manners, and of a handsome, prepossessing appearance. In the circle of his friends he is said to have been irresistible, and probably to the charms of his manner his success in life was somewhat owing. His career amply proves that he was a man of the greatest talent, sagacity, and power of managing men. He was undoubtedly a great lawyer, and his judgments, which have been much praised for their accuracy, fill a small library; at the same time, he took so long to arrive at them, that he has been charged with having caused more injustice by delay than worse judges by the iniquity of their decisions. For literature, as for art, he had no feeling, and the style of his decisions is generally detestable. He was a great drinker, though drink seems never to have unfitted him for work; and is said, when he went into retirement, to have spent his time over the newspapers and the gossip of old cronies, preferring their company to that of men of refinement and taste. Undoubtedly, the best of him is seen in his private relations. His love of and devotion to 'Bessy' his wife was truly beautiful. As a public man, he is far from estimable. He was a great canter, whose life was a succession of intrigues and duplicities. He was no statesman; his one aim in politics was power, and his name is unassociated with even a single law intended purely for the public good. For forty years, he was a leading enemy of reform and religious liberty. The champion of the church, he never attended on public worship. Without political principles, his whole stock in trade, as a politician, was zeal against the Roman Catholics, which, however, proved enough, in the then state of society. He is said to have added parsimony to his other defects; but while various circumstances, besides the amount of the fortune which he accumulated, favour this charge, it is probable that his apparent parsimony rose out of habits formed in his family while he was yet struggling; and it is certain he was capable of generous actions. See Twiss's admirable book, *Public and Private Life of the Lord Chancellor Eldon; Life of Lord Eldon*, by Lord Campbell; *Sketch of the Lives of Lords Stowell and Eldon*, by Dr W. E. Surtees.

**EL DORA'DO** (the Golden, or rather the Gilded Land) existed originally in the imaginations of the Spanish conquerors of America, whose insatiable avarice loved to dream of richer rewards than those of Mexico and Peru. The Castilians found an imitator in Sir Walter Raleigh, who twice visited Guiana in quest of this fabulous region. The name has at last made for itself an abiding-place beyond the furthest limits of Spanish possession. It indicates a county in the north-east of California, of which the capital, Calloma, stands near the spot where the first discovery of gold was made in that state. The district in question is drained by some of the northern feeders of the Sacramento, which empties itself into the Bay of San Francisco.

**ELËA'TIC SCHOOL.** The group of ancient Greek philosophers so called begins with Xenophanes of Colophon, who settled in Elea, a Greek city of Lower Italy (whence the name), and includes Parmenides and Zeno, who both belonged to Elea, and also Melissus of Samos. The most flourishing period of this philosophy falls from 540 to 460 B. C. In opposition to the physical philosophy of the Ionic school, and to the doctrine of Heraclitus (q. v.), who denied all being or existence, the Eleatic philosophers made this conception of pure being, unmixed with all marks or properties derived through the senses, the foundation of all their speculations. As being, one and unchangeable, seemed to them to exclude all plurality and alteration of appearances, they gave up, with remarkable consistency, all attempts to explain scientifically the world as we see it; and the startling abruptness of their simple fundamental principle, taken in conjunction with the opposite doctrine of Heraclitus, was one of the chief causes that led Plato at a later period to attempt a reconciliation between the notions of *being* and *becoming*, or of absolute existence and phenomena.

**E'LECAMPANE** (*Inula*), a genus of plants of the natural order *Compositæ*, sub-order *Corymbiferæ*, nearly allied to *Aster*. The only important species is the common E. (*I. Helenium*), a native of damp meadows in the middle and south of Europe, rather rare in Britain. This plant was formerly much cultivated for its root, which was used in medicine, and still retains its place in the pharmacopœias, although comparatively neglected. The root has a faint aromatic odour; and a bitter, acrid, and somewhat camphor-like taste. It acts as a gentle stimulant to the organs of secretion, promotes expectoration, and is diuretic and sudorific. It contains a peculiar principle called *Inulin*, which resembles starch, but is deposited unchanged from its solution in boiling water on its cooling, and gives a yellowish instead of a blue colour with iodine; also another peculiar principle called *Helenin*, or *Elecampane Camphor*, which resembles camphor in some of its properties.

Elecampane (*Inula Helenium*).

**ELE'CTION** denotes, in theological language, the divine act by which certain individuals are chosen to salvation in Christ, and the doctrine of election is the doctrine of 'God's everlasting purpose, whereby he hath constantly decreed by his secret counsel to deliver from curse and damnation those whom he has chosen in Christ out of mankind, and to bring them by Christ to everlasting salvation as vessels made to honour.' These words, taken substantially from the articles of religion of the Church of England, may be said to represent, in a moderate form of expression, the orthodox doctrine on the subject of election. Besides this form of the doctrine, there is a lower and a higher form of it, which, apart from technical and polemical language, may be said to spring—the one from the supposed subordination of the divine act or purpose to the divine foreknowledge of human conduct—the other from the exaltation of the divine act or purpose into an absolute and arbitrary supremacy, having no relation whatever to human will or conduct. The former of these extremes corresponds to the Pelagian or Arminian doctrine of election, the latter to the hyper-Augustinian or Calvinistic. The Arminian aims to condition or limit the absolute character of the divine act in redemption in some way or another; the Calvinist aims to give to this act the most arbitrary and irresponsible character. The one, while not altogether repudiating a doctrine of election, yet gives such prominence to the human conditions of the elective purpose, as (in the view of Calvinists) to destroy it altogether; the other maintains not only a doctrine of election or predestination, but also the correlative doctrine of reprobation. In the view of the Arminian, salvation is within the choice of the human will; in the view of the Calvinist, the human will is of little or no account—the decree of God is everything—and this decree (which Calvin admitted to be a '*decretum horribile*') absolutely determines some to everlasting life and some to everlasting death.—The separation has its source in the will of God, and not in the moral conditions of mankind.

It is obvious, in the mere statement of such views, how audaciously theology has sought to settle questions beyond all human scrutiny and settlement. In the nature of things, the relations between the divine and human will appear indeterminable; and, notwithstanding all the labour of inquiry devoted to such subjects in the past history of opinion, it cannot be said that any advance of thought has been made regarding them. If the mere logic of the question be kept in view, the Calvinistic opinion has the advantage over the Arminian—setting out, as it does, from the recognition of the divine will as absolutely supreme, and the source, consequently, of all subordinate action—a thought which is in the highest degree logically consistent. But then the moral perplexities which arise out of the practical application of this view, and the ease with which it may be perverted into a fanatical and dangerous error, will always repel many minds from its adoption.

Although the expressions election, elect, &c., are frequent in Scripture, it cannot be said that what is known as the theological doctrine of election was acknowledged by the Christian Church till the time of Augustine. The Greek Fathers confined their attention almost entirely to questions purely *theo*logical—that is to say, relating to the character and constitution of the Godhead. Gnosticism and Arianism, the two main forms of heretical opinion before Augustine, indicate the channels into which theological discussion had previously run. It was not till the Latin mind had taken up this discussion, that the more practical question of the relation of the divine and human will in redemption came to receive special attention. The controversy between Pelagius and Augustine in the beginning of the 5th c., brought out almost all the aspects of the question which have since, at successive epochs in the history of the church, risen into renewed prominence. The contests between the Scotists and Thomists in the 14th c. between the Arminians and Calvinists, and, within the Roman Church, between the Jansenists and Molinists in the 17th c., are recurring expressions of the same radical conflict or divergency of opinion. The spirit of modern theology is adverse to the logical disputations engendered by such discussions, and finds its more appropriate and useful field of labour in the province of critical and historical inquiry.

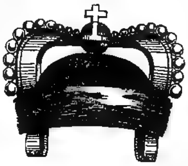
**ELECTION COMMITTEE.** See Parliamentary Election.

**ELECTION LAWS.** See Parliamentary Election.

**ELECTION OF SCOTTISH PEERS.** See Parliamentary Election, Peers, Elective.

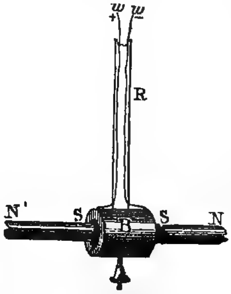
**ELE'CTORS,** in the German empire, were those great princes who had the right of electing the emperor or king. In the earliest times, under the Carlovingians, the crown was hereditary; afterwards, Germany became formally an elective monarchy, but the election was practically almost limited to the reigning family. Under the Emperor Charles IV., the right of election became limited to the holders of the highest ecclesiastical and civil offices, some of which gradually became hereditary, and connected with territorial principalities, as in the case of the Hohenstaufens and of the Dukes of Bavaria, Saxony, Swabia, &c. Thus there arose seven electors, those of Mayence, Treves, and Cologne (as being the chief primates and chancellors of the empire), the electors of the Palatinate and of Bavaria long exercising the right by turns, and the electors of Brandenburg, Saxony, and Bohemia. From 1400 to 1708, the right was never exercised on the part of Bohemia, but otherwise no change took place from the middle of the 14th c. to the peace of Westphalia. By the peace of Westphalia, an eighth electorate was established, Bavaria and the Palatinate being each allowed the full right; and in 1692, a ninth was added, that of Brunswick-Lüneburg, but not without resistance by the electors and states of the empire, so that the new electorate was not fully recognised till 1710. In 1777, the number was again reduced to eight, the Elector Palatine inheriting Bavaria. The electors held a high and very peculiar position in the German empire. The Golden Bull describes them as 'the seven pillars and lamps of the holy empire.' They had certain important rights and privileges. They were leagued from the year 1338 for the maintenance of their freedom of election against the pope. They had royal dignities, only not the title of Majesty. The territories belonging to their electorates were indivisible.

The peace of Luneville, in 1801, made a great change in the German empire, and subsequent changes took place during the times of French ascendency, which issued in the dissolution of the ancient German empire. The title of Elector, still used by the Elector of Hesse-Cassel, an electorate which was added along with other new electorates in 1802, is the sole relic of the old dignities, and is now merely nominal.


Electoral Crown.

**Electoral Crown,** or, more properly, **Cap,** was a scarlet cap, turned up with ermine, which was worn by the electors of the Empire. It was closed with a demicircle of gold, covered with pearls, and on the top was a globe with a cross on it, also of gold.

**ELE'CTRIC CLOCK.** The regularity of the clock depends, as is well known, on the action of the pendulum, which is isochronous—that is, has the property, within certain limits, of describing long and short arcs in the same time. See Pendulum. The pendulum, however, left to itself, would, in consequence of the resistance of the air, and of the spring on which it hangs, soon come to rest. An impulse must therefore be given it occasionally, to keep it going. This impulse need not necessarily be exactly the same, for though it might cause the pendulum to make a longer swing at one time than at another, the time of oscillation would not differ. In ordinary clocks, these impulses are given by a heavy weight, and are transmitted to the pendulum through the wheelwork of the clock. No moving power can be more steady than gravity, or less likely to tax the isochronism of the pendulum, but its action on the clock is limited by the distance through which the weight descends, so that the weight must be periodically wound up, to keep gravity in play. The trouble of winding, though small, still leaves room for the wish that a clock might be constructed going for long periods without external help. Such an instrument the electric clock professes to be, and such really it has proved itself. Several clocks of this kind have been made, which continue to move months, if not years, without attention; but their performance, though good, has not rivalled the steadiness and certainty of the finer gravity clocks. Electric clocks may be divided into two classes—those in which the impulse is given to the pendulum directly by electric power, and those in which it is given by a weight or spring alternately liberated and restrained by electricity. Of the first kind, that invented by Bain is best known. In the ordinary clock, it is the clock that moves the pendulum; in Bain's clock, it is the pendulum that moves the clock. As the construction of the pendulum is the only part of it connected with electricity, we shall confine our notice to a general description of the pendulum action. The lower part of the pendulum arrangement is shewn in the figure. The bob B consists of a bobbin of insulated copper wire, and is hollow in the centre, the wires *w*, *w* from both ends ascending the pendulum rod R (the lower part of which alone is seen), and are in metallic connection respectively with the two springs from which the pendulum hangs. Two magnets or bundles of magnetic rods, NS, N′S′, are fixed at either side of the bob, and are of such dimensions that the hollow bob in its oscillation can pass a certain way over each without touching. The magnets have their like poles turned towards each other. The two springs of the pendulum rod are in connection with the two poles of a galvanic battery. The wire connecting one of them is made to pass round by a break (not shewn in the fig.), worked by the pendulum rod. When the pendulum is made to move, say towards the right, it shifts a slider, so as to complete the connection between the poles of the battery. The current thereupon descends one of the wires of the pendulum, passes through the coil of wire forming the bob, and ascends by the other. In so doing, it converts the bob into a temporary magnet, the south pole towards the right, and the north pole towards the left. In this way, the south pole of the bob is repelled by the south pole S of the right-hand magnet; and its north pole is attracted by the south pole S′ of the left-hand magnet, so that from this double repulsion and attraction both acting in the same direction, the bob receives an impulse towards the left. Partly, therefore, from this impulse, and partly from its own weight, the pendulum describes its left oscillation; and when it reaches the end of it, it moves the slider so as to cut off the battery current, and then returns towards the right, under the action simply of its own weight. On reaching the extreme right, as before, it receives a fresh impulse; and thus, under the electric force exerted during its left oscillation, the motion of the pendulum is maintained. So long as the electricity is supplied, will the pendulum continue to move. The current required is exceedingly weak, and Bain considered that it could be sufficiently excited by a plate of copper and a plate of zinc sunk into the ground, and acted upon by the moisture usually found there. This earth-battery, as he called it, was expected to act steadily for years; but the result proved far otherwise, for the soil not unfrequently dried up, leaving no trace of electrical action. The imperfection of the battery has led to a strong prejudice against these clocks—stronger, certainly, than they merit. It has been found, however, by those who have employed them for astronomical purposes, that little dependence could be placed on them, and that the proper conditions of pendulum motion were, from the unsteady supply of electricity, interfered with; hence the opinion has been generally accepted, that a pendulum moved immediately by electricity, does not keep very accurate time; and the efforts that have of late been made in electric clock-making have aimed at rendering the pendulum independent of the irregularities of the motive agent.



Electric Pendulum.

Before noticing these, it may be well to refer to a very important application that has been made by Mr Jones of Chester of Bain's pendulum. Shortly after the invention of Bain's clock, Professor Wheatstone suggested that any number of such clocks could be made to move simultaneously by the same current of electricity. Mr Jones has turned this idea to account in the following way. A standard clock of the usual construction is made, by regulating the flow of a galvanic current, to control the action of any number of secondary clocks, likewise of ordinary construction. The pendulum of the standard clock, on passing towards the right, touches a spring, placed at the side, thereby completing the battery connection, and a current is transmitted to the secondary clocks in a certain direction. On passing to the left side, the same takes place, but the current is made to go this time in the opposite direction. The pendulums of the secondary clocks are made on Bain's principle, but have, of course, no break to move, as the primary pendulum performs that function. Let us suppose, at first, that all the pendulums are at rest; in this case, no current is transmitted. Let the standard pendulum now be moved to the right, the right spring is touched, and a current at the same instant circulates through the bobs of the secondary pendulums, and they thereby receive a simultaneous impulse towards the left. All the pendulums move then to the left; and on reaching the extremity of this oscillation, the standard pendulum touches the left spring, and the secondary pendulums are now impelled to the right. The motion of the secondary pendulums soon increases, until it reaches its proper extent. The pendulums once set agoing, are, however, not intrusted solely to the stimulus of the electricity, but are moved by their own weights, as in ordinary clocks, so that if the electricity ceased to be sent to them, they would go on without it. It might be supposed that a confusion of the two forces, electricity and gravity, would ensue; such, however, is not the case. While the motion of the clock is intrusted to its own weight, the pendulum submits docilely to the controlling action of the electricity; and thus a secondary clock of little value may be invested with all the perfection of the most costly observatory clock. The success of Jones's pendulum has been severely tested in the arrangement employed by Professor Smyth for firing the one o'clock time-gun at Edinburgh. A clock in the Castle of Edinburgh is made to liberate the trigger of the gun exactly at one o'clock. This clock is regulated on Jones's principle, by a clock at the Observatory on the Calton Hill, nearly a mile distant. The Observatory clock, by means of electricity, sets off a time-ball on a neighbouring monument at the same instant. The fall of the ball, and the flash of the gun, though occasioned each by its own clock, are perfectly simultaneous.

In the second class of electric clocks, the electricity is not charged immediately with the maintaining of the pendulum motion, but draws up the weight, or liberates the spring which discharges that function. This is the same principle as holds in what is known in horology as the 'remontoir' escapement. Mr Shepherd of London was the first to introduce this principle into electric clock-making, and one of his clocks on a large scale was exhibited at the Great Exhibition of 1851.

**ELECTRIC FISHES.** See Electricity, Animal.

**ELECTRIC LIGHT.** When the ends of two wires which form the poles of a powerful galvanic battery are made to touch, and then are separated for a short distance, the current which passes when the contact is made does not cease with the separation, but forces its way through the intervening air, accompanied with an intense evolution of light and heat. So great is the heat evolved that the most refractory metals are melted by it, and therefore some substance rivalling the metals in conducting power, but much more infusible, must be found to act as the poles, to allow of the continuation of the current in such circumstances. The various forms of carbon are well suited to this purpose; the more compact forms of charcoal answer very well; baked carbon (see Carbon for Electrical purposes) answers better; but the coke that is sublimed inside the retorts in the distillation of gas, both for durability and conducting power, makes by far the best poles. Sir Humphry Davy first discovered and described the electric light. Fig. 1 represents a simple arrangement for producing it. The carbon-points P, N are fixed into hollow brass rods, which are connected with the battery by wires entering at the binding screws *s*, *s*. The rods slide in the heads of the glass pillars A, A, fixed to a stand, so as to admit of the points being placed at different distances. The wires from the battery poles being properly connected, the points are made to touch, and are then withdrawn a line or two, when the most dazzling light ensues, somewhat approaching the light of the sun in purity and splendour. Its intensity is such as to prevent the eye from examining the particulars of its production. These, however, may be ascertained by projecting with a lens of short focus the images of the points on a screen, when they are seen as shewn in the figure. The light is found to arise chiefly from the intense whiteness of the tips of the carbon rods, and partially from an arch of flame extending from the one to the other. The positive pole is the brightest and the hottest—a fact which may be proved by intercepting the current, when the positive pole continues to appear red for some time after the negative pole has become dark. During the maintenance of the light, a visible change takes place in the condition of the poles. The positive pole experiences a loss of matter—particles of carbon pass from it to the negative pole, which they partly reach, and partly are burned by the oxygen of the air on the way. The same takes place, though to a much less extent, with the negative pole; so that while the positive pole becomes hollowed out or blunt by its losses, the negative pole remains pointed by its apparent gains. The wasting away, particularly of the positive pole, in a short time renders the distance between the poles too considerable to allow of the passage of the current, and the light is thus suddenly extinguished, until again renewed by contact and removal. The transference of matter between the poles is considered to account for the existence of the arch of flame, and the passage through the air of the current, as thereby a conducting medium extends between the poles. The heat of this arch of flame, or *voltaic arc*, as it is called, is the most intense that can be produced. Platinum melts in it like wax in the flame of a candle. Quartz, the sapphire, magnesia, lime, and other substances equally refractory, are forced by it into a state of fusion. The diamond when placed in it becomes white hot, swells up, fuses, and is reduced to a black mass resembling coke. In this condition, it is still hard enough to scratch glass, but possesses almost no consistency, giving way to the pressure of the fingers. From an analysis of the spectrum given by the electric light, it is found to be caused not by the combustion of the carbon, but by its being brought into a state of incandescence. It is found to abound in violet rays, and is hence well adapted for photographic purposes. The electric light can be produced in a vacuum, and below the surface of water, oils, and other non-conducting liquids. It is thus quite independent of the action of the air, a circumstance which may yet be turned to useful account. With a battery of some fifty Bunsen's elements, a light is produced of very great brilliancy; but when very great power is to be obtained, as well as brilliancy, twice or thrice that number must be employed. Fifty cells give an electricity of the needful tension to produce the light; and if more be employed, they must add to its strength, and not its tension. Thus, if 150 cells be used, they would be best arranged in three batteries, the positive poles of all three being joined to form one positive pole, and similarly with the negative poles. With a battery of forty or fifty cells, no pointing of the rods is necessary, as this is done by the action of the electricity itself.

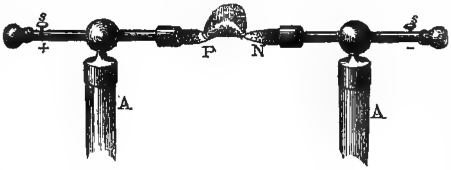


Fig. 1.

Various arrangements have been invented for maintaining the steadiness of the electric light. The aim in all such is to keep the carbon points, by some mechanical contrivance, within such a distance of each other that the current can pass between them. Foucault, aided by Duboscq, was the first who constructed an electrical lamp of this description. In it, by aid partly of an electro-magnet, and partly of clock-work, the two points are made to travel towards each other at rates corresponding to those of their consumption, the positive pole in this way travelling faster than the negative. The relative distance of the points, and their position in space, thus remain the same. In the simpler form of electric lamps now constructed, it is only sought to keep the points at the same distance, the wasting away of the negative pole being so slow as not much to alter the absolute position of the light. Among these lamps, that of Mr Hart of Edinburgh deserves notice for its simplicity and efficiency. It is shewn in fig. 2. The current enters by the binding screw L, ascends the hollow pillar K by an insulated wire, passes under the gallery C, and circulates through the coils of the electro-magnet BB. The wire which forms these coils is soldered at its other extremity to the framework supporting the electro-magnet, so that the whole headpiece of the apparatus may be considered as the positive pole of the arrangement. The rod AA, to the lower part of which the stick of carbon P is fixed, moves up and down in the axis of the headpiece. It passes at E through a hollow cylinder, which rests on the paltform H, and has its upper part cut into two halves, moving on hinges, which, when the whole rests on H, lie outwards, and give the rod AA full play to move up or down, when so urged. When, however, the armature F of the electro-magnet is drawn up by the passage of the current, the ring D, which is fixed to it, and which encircles the upper part of the split cylinder E, brings the two halves together, so as firmly to embrace the rod AA, which consequently rises with the armature. The rod AA is roughened by circular file-marks, to render this action the more certain. The current passes from the frame of the electro-magnet into the rod AA, by several surfaces of contact, then by the carbon point P to the opposite point N, and thence by the binding screw L′ to the battery. Thus, before the current circulates, the rod AA, and the point P, rest by their weight on the point N. The instant, however, this takes place, the point P is withdrawn to a short distance from N, by the action of the electro-magnet, and all the brilliant effects of the electric light are produced. When the carbon rods, by their wasting away, stand at length so far apart that the current cannot force its way from the one to the other, the current being stopped deprives the electro-magnet of its power, and the armature, in consequence, falls, and allows the point P to drop on N. The contact is thus again renewed, and P is drawn up to its former distance from N. The interval that elapses between the breaking and the renewing of the current is so short, that the steadiness of the light is not interfered with, a sudden, scarcely perceptible blinking being all that indicates such an occurrence. The light continues without interruption till the positive carbon rod is exhausted, which generally takes about an hour, when a renewal at least of the positive rod becomes necessary. A lamp like this gives a splendid illumination to the magic lantern or the solar microscope, the lenses of each being made to slide vertically for a small distance, to allow the centre of the points to be kept always in the optical axis.

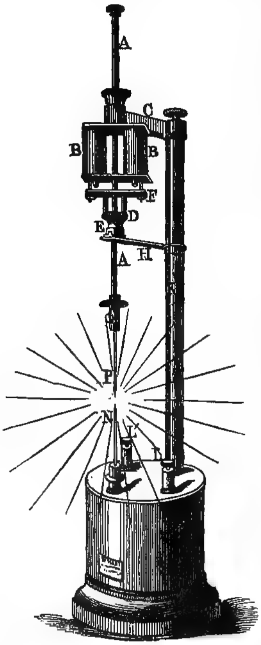


Fig. 2.

The attempts which have been made to substitute the electric light for coal-gas in lighting up streets and public places, have hitherto proved unsuccessful. One element of imperfect success is to be found in the unsteadiness and short duration of the light. By contrivances similar to those described above, the light may be continued for a few hours, but even then it requires the constant watching of an attendant. Another arises from the striking and unpleasant contrast of light and shadow that accompanies it, rendering, as it were, the surrounding gloom as manifest as its brightness. It has, however, been used with excellent effect where a limited space had to be lit up for a few nights, such as in the construction of bridges across rivers and the like. Were the difficulty of constructing a constant electric lamp completely overcome, there would still remain that of producing a steady current of electricity to keep it in action, if we had no other source than the voltaic battery. The maintaining of some 50 or 100 Bunsen cells in full action for weeks and months together, is a task attended with no ordinary annoyance, and one which of itself would be sufficient to condemn the practicability of the electric light for public illumination. This difficulty, however, is now removed by the employment of electricity generated by magnets (see MAGNETO-ELECTRICITY), which requires nothing but an easily applied mechanical motion for its continued maintenance. An electric light produced from this source has been tried, with promising success, in the South Foreland Light-house.

**ELECTRIC TE′LEGRAPH.** See TELEGRAPH.

**ELECTRI′CITY,** the name used in connection with an extensive and important class of phenomena, and usually denoting either the unknown cause of the phenomena or the science that treats of them. Most of the phenomena in question fall under the three chief heads of Frictional Electricity, Galvanism, and Magneto-electricity. The present article is confined to the first.

*Historical Sketch.*—Thales, about 600 B.C., refers in his writings to the fact that amber, when rubbed, attracts light and dry bodies. This was the only electric fact known to the ancients. The science of electricity dates properly from the year 1600 A.D., when Gilbert of Colchester published a book, entitled *De Arte Magnetica*, in which he gives a list of substances which he found to possess the same property as amber, and speculates on magnetic and electric forces. He is the inventor of the word electricity, which he derived from the Greek word *electron*, amber. Otto von Guericke, burgomaster of Magdeburg, in his work *Experimenta Nova Magdeburdica* (1672), describes, among his other inventions, the first electric machine ever made, which consisted of a globe of sulphur turned by a handle, and rubbed by a cloth pressed against it by the hand. Hawksbee (1709) constructed a machine in which a glass cylinder, rubbed by the dry hand, replaced Guericke's sulphur globe. Grey and Wehler (1729) were the first to transmit electricity from one point to another, and to distinguish bodies into conductors and non-conductors. Dufay (1733—1745) shewed the identity of electrics and non-conductors, and of non-electrics and conductors, and was the first to discover the two kinds of electricity, and the fundamental principle which regulates their action. Between the years 1733 and 1744, much attention was given in Germany to the construction of electric machines. Up to this time, notwithstanding the inventions of Guericke and Hawksbee, the glass tube rubbed by a piece of cloth which Gilbert first introduced, was used in all experiments. Boze, a professor at Wittenberg, taking the hint from Hawksbee's machine, employed a globe of glass for his machine, and furnished it with a prime conductor. Winkler, a professor at Leipsic, was the first to use a fixed cushion in the machine. The Leyden jar was (1746) discovered accidentally at Leyden by Muschenbroek; but the honour of the discovery has been contested also in favour of Cuneus, a rich burgess of that town, and

Kleist, canon of the cathedral of Camin, in Pomerania. Franklin (1747) shewed the electric conditions of the Leyden jar, and (1752) proved the identity of lightning and electricity by his famous kite experiment. This last was performed with the same object about the same time, and quite independently, by Romas of the town of Nerac, in France. In 1760, Franklin made the first lightning-conductor. Canton, Wilke, and Æpinus (1753—1759) examined the nature of induction. Ramsden (1768) was the first to construct a plate-machine, and Nairn (1780) a two fluid cylinder-machine. The electrophorus was invented by Volta in 1775, and the condenser by the same electrician in 1782. In 1786, Galvani made the discovery which led to the addition of the new branch to the science which bears his name, and which now far exceeds the older branch in extent and practical value. See GALVANISM. In 1787, Coulomb, by means of his torsion-balance, investigated the laws of electric attraction and repulsion. In 1837, Faraday published the first of his researches on induction. Armstrong, in 1840, designed his hydro-electric machine.

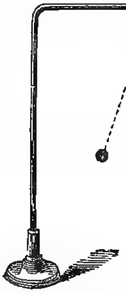


Fig. 1.

*Fundamental Facts.*—Under the head CONDUCTORS (q. v.) it is stated that bodies which do not conduct electricity, or non-conductors, are capable of electrical excitation from friction, and are, in consequence, termed electrics, and that conductors not so affected are called non-electrics. The *fundamental principles* of electricity are illustrated by the *electric pendulum* (fig. 1). A glass tube bent at right angles, so as to project horizontally, is placed on a convenient stand. On the hook in which its upper end terminates, a cocoon thread is hung, to the end of which a pith-ball is attached. The ball is thus doubly insulated by the glass and the silk thread. If a tube of glass be rubbed by a dry silk handkerchief, and brought near the ball, the ball is at first briskly attracted, and then as briskly repelled; and if the tube be then moved towards it, it moves off, keeping at the same distance from it. The ball being so affected, or charged, as it is called, a rod of shell-lac or of sealing-wax, after being rubbed with flannel, attracts it, if possible, more briskly than before, and again sends it off exactly as the glass had done. If the glass tube be now again taken up and rubbed a second time, if necessary, the ball will act towards it as it did towards the sealing-wax. The same series of attractions and repulsions would have taken place if we had begun with the sealing-wax instead of the glass tube. We interpret this experiment in the following way. When glass is rubbed with silk, it becomes invested with a peculiar property, which gives evidence of its existence by attracting a pith-ball or any other light substance; and after contact has communicated this property to the ball or other matter, repulsion takes place between them. In consequence of the ball being suspended by an insulating thread, it retains the property of rubbed glass thus given it; and although then repelled by a body having the same property, it is powerfully attracted by rubbed sealing-wax. After contact again takes place, and the property of rubbed sealing-wax has replaced that of rubbed glass in the ball, the two similarly affected bodies again repel, and the same series of attractions and repulsions will continue if we present the glass and the wax alternately to the ball. These properties or affections, developed by friction, are called *electricities*—that of glass is called *vitreous electricity;* that of sealing-wax, *resinous electricity,* glass and resin being the type-substances in which they are produced. The electricities here evolved by friction can be produced in a great variety of ways, both mechanical and chemical, but however developed, their characteristics are the same. For vitreous, *positive,* and for resinous, *negative,* are now almost universally substituted; and although these terms are meaningless as applied to two similar affections of matter, they have the advantage of being definite, and of having no reference to the source whence the electricities originate. They admit, moreover, of a very convenient contraction, viz., the algebraic + for *positive,* and − for *negative;* and when written in this way, their relative opposition, so to speak, is graphically shewn. We are taught by the above experiment, *that bodies electrified either positively or negatively, attract neutral bodies and bodies affected with electricity of an opposite name to their own, but repel those affected with electricity of the same name; and that electricity can be communicated from one body to another by contact.* Contact is not the only way in which electricity is communicated. We find, when we deal with larger bodies than the pith-ball of the experiment, and sometimes even with it, that the passage of a *spark* between two bodies without contact communicates the electricity of the one to the other. The part played by the rubbers in the above experiment must not be overlooked. The silk handkerchief employed to rub the glass assumes the resinous or − electrical state, and the flannel rubber of the sealing-wax the vitreous or +. This cannot, however, be clearly shewn, as the experiment is performed, for the rubbers are in each case tightly embraced by the hand, which carries off their peculiar electricity, so that they give feeble, if any, evidence of electrical excitement. As the rods are held only by their extremities, the electricities of the untouched portions suffer almost no diminution. If, however, the rubbers, as well as the rubbed surfaces, be insulated, as they may be in the electrical machine, they shew opposite electricities. The same thing may be illustrated thus: two similar discs—one of glass, the other brass covered with silk—held by insulating handles, are rubbed together. So long as they are kept touching, no electricity is shewn, for the opposite electricities neutralise each other; but when they are separated, the former shews +, the latter − electricity. Hence we conclude, that *when one electricity is produced, as much of the opposite electricity is produced.*

The relative nature of the rubbing and rubbed surfaces determines the kind of electricity which each assumes. Thus, if glass be rubbed by a cat's fur instead of silk, its electricity is − instead of +. In the following list, each body, when rubbed by any one preceding it, is negatively electrified; by any one succeeding it, positively: cats' fur, smooth glass, linen, feathers, wood, paper, silk, shell-lac, ground glass. When two pieces of the same material are rubbed together, the colder or smoother becomes positively excited. Metal filings rubbing against a plate of the same metal determine − electricity in themselves, and + electricity in the plate. When a white silk ribbon is rubbed by a black one of the same texture, the white one becomes +. A plate of glass becomes + when a stream of air is directed against it from a pair of bellows. The friction caused by steam of high tension issuing from a narrow pipe develops electricities in the steam and pipe which depend on the material of the latter. This fact has been turned to advantage by Armstrong in the construction of a boiler electrical machine of immense power.

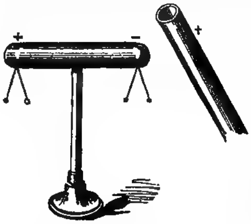


Fig. 2.

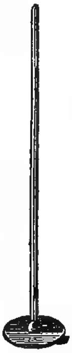


Fig. 3.

*Induction.*—Free electricity has the power of inducing the bodies in its neighbourhood to assume a peculiar electrical condition; this is exhibited in the following simple way: A brass cylinder, rounded at both ends (fig. 2), is insulated on a glass pillar. Two pith-balls, hung by cotton threads, are attached at either extremity. When a glass tube is briskly rubbed, and placed within a few inches of the end of the cylinder, the balls at each end diverge, shewing that each pair is charged with similar electricities. When the glass tube is withdrawn, the balls hang down as before, so that the electrical excitement of the cylinder is merely temporary, and dependent on the proximity of the excited tube. If, while the balls are apart, a *proof plane,* consisting of a small disc of gilt paper insulated at the end of a glass rod (fig. 3), be made to touch the end next the tube, and then transferred to an electrometer, the electricity is found to be − ; if the same be done at the other end, it is +. The nearer end of the cylinder is thus induced by the + electricity of the glass to assume the negative electric state; and as no — electricity can be excited without as much + electricity, we find the other end positively electrified to the same extent. It appears, besides, from the positions taken up by them, that *both electricities observe the same attractions and repulsions as the bodies affected by them.* This action of the electricity of the tube inducing in the cylinder this peculiar electrical condition, is called induction; and the cylinder in this state is said to be *polarised* —that is, to have its poles or ends like a magnet, each having its similar, but relatively opposite force. If the hand touch the cylinder, the balls next the tube diverge further than before, and the other two cease to be affected. In this case, electrically speaking, the cylinder is a portion of the ground, for the hand and body are conductors; its surface therefore being increased, more − electricity is developed than before, and the + electricity is thrown back into the ground, and is lost. The − electricity is kept fixed in the part of the cylinder opposite the tube by the + electricity of the latter; and when the hand is first removed, and then the tube, it causes the balls at both ends to diverge permanently. We thus see that electricity can be produced and insulated in conductors by the action of free electricity on them. The + electricity of the further half of the cylinder (fig. 2) is as free and insulated as if no − electricity existed within it. This is shewn by placing a cylinder near the first, forming a continuation of it, as it were, without touching, when the second cylinder, under the induction of the + electricity of the first, is thrown into the same state as the first. This second can induce the same state in a third (fig. 4), and so on. As the excited tube is withdrawn, the whole series return to their natural condition without being in any way permanently affected. The moment, however, it is again brought near, there is manifested at the further termination of the last a + electricity, which exerts the same influence there as if a portion of the electricity of the tube had been actually communicated or transferred to it.

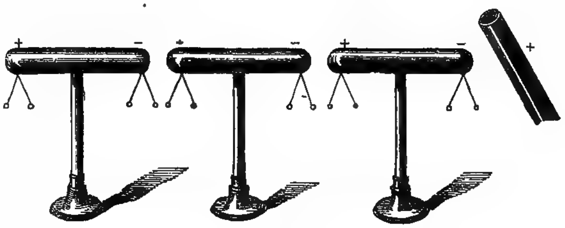


Fig. 4.

The air intervening between the tube and the cylinder is termed the *dielectric,* for it is through it that the electric action is propagated. In proof of this, we have only to place a cake of shell-lac between the tube and cylinder (fig. 2), when the polarity of the cylinder will rise higher than before, as would be shewn by the further divergence of the balls; and if this or a similar experiment be conducted with sufficient care, we find that the inductive action varies in amount for each non-conductor. Induction, therefore, we have reason to conclude, is not the direct action of one body on another, but an action transmitted through the contiguous particles of a non-conducting medium. In further proof of this, Faraday, who was the first to examine the function of the dielectric in induction, has shewn that the action takes place through air in curved as well as in straight lines, which implies the action of an intervening medium. The relative powers of different substances in facilitating induction, are termed by this philosopher *their specific inductive capacities.* The following table by Sir W. S. Harris gives the specific inductive capacities of the more important non-conducting substances, taking that of air as unity: Air, 1·00; resin, 1·77; pitch, 1·80; bees-wax, 1·86; glass, 1·90; sulphur, 1·93; shell-lac, 1·95. All gases, whether simple or compound, have the same inductive capacity, and this is not affected by temperature or density. If a large plate of metal be placed between the glass tube and the cylinder, the polarisation of the cylinder instantly vanishes, for the induction is diverted by it into the ground.

*Theory of Induction.*—Faraday, taking for granted that the dielectric is the essential medium of induction, suggests that the molecules of air and other dielectrics are conducting, but that they are insulated from each other. We have already seen (fig. 4) that by induction, part of the electricity of an insulated body can be in effect transferred to a surface at some distance from it, without any loss experienced by the exciting body. If, now, we could imagine a series of insulated cylinders diverging in all directions from the glass tube in fig. 4, we have reason to expect that the whole of the electricity of the tube would be in effect transferred to their outer extremities without loss of electricity to the tube. To prove that such would be the case, Faraday took a pewter ice-pail, 10½ inches high, and 7 inches in diameter, and insulated it, placing the outside of it in conducting connection with the knob of a gold-leaf electroscope. An insulated ball, charged with + electricity, was then introduced into it without touching. The pail was thus subjected to polarisation, the − electricity being on the inner, and the + electricity on the outer surface. The divergence of the leaves increased as the ball was lowered, until it sunk three inches below the opening, when they remained steadily at the same points. The ball was lowered till it touched the bottom, and communicated its charge to the pail, when the leaves remained in the same state as before, shewing that the + electricity developed by induction on the outer surface was exactly the same in amount as that of the ball itself. He then altered the experiment so as to have four insulated pails inside each other, and the effect on the outmost pail was in no way altered. Here the action of the air between the pails was in effect the same as that of the pails themselves, and if the molecules of air were insulated conductors like these, they would have acted in no way different from what they did. The action of the molecules of air, in certain circumstances, appears to favour the idea, that they are individually conducting. The discharge of electricity by spark through the air, shews that they can be forced to act as conductors; and the currents which proceed from points highly charged with electricity, appear to indicate that they can be attracted and repelled like the pith-balls of our first experiment. It may be urged against the theory, that it is only shifting the difficulty; for by what medium are the molecules of air insulated from one another and from other bodies, and by what means do they act inductively on each other? But this objection relates to the molecular condition of matter, concerning which we are as yet ignorant. The way in which one molecule acts upon another need not be the same as that between mass and mass, for it is to be expected that the molecular relations of matter being final, should have something peculiar. Molecular action, to which we must refer the phenomena of induction, appears to consist in a polarity of each molecule similar to what we find in masses; but how that polarity is propagated, and how each molecule is insulated from discharge, must at present be referred to the final nature or properties of matter. According to this theory, then, an excited body is the centre of polarisation, from which a chain of polarised insulated particles, whether of air or other material, proceed to surrounding uninsulated conductors in straight and curved lines. On the nearer surfaces of these it attracts the opposite electricity to its own, and repels into the ground an electricity of the same name and amount as its own. The leading idea in Faraday's theory is, not the repulsion of one electricity towards itself, but its cor-relation and attraction to the opposite electricity. Electricity is regarded as a polar or double force, which never exhibits one only of its forces, both being necessary to each other's separation and existence.

Faraday considers that the molecules of a dielectric during induction are thrown into a certain polarised condition, which is one of constraint, as it is only sustained by the action of the exciting body. The term *tension* may be applied to this condition; and when we speak of an electricity of high tension, we mean an electricity of high constraining or polarising power, which is exhibited in its force of attraction or repulsion, and in the readiness with which it discharges itself by spark. This is quite in keeping with the strict meaning of 'tension' in general works on electricity, where it refers to the concentration of electricity on one spot: thus, if we give a charged ball as much electricity as it already has, its electric tension is said to be doubled. The constraint of the polarised particles of a dielectric appears to be mechanical as well as electrical, for when the polarisation rises to too high a pitch, their cohesion is destroyed in a disruptive discharge.

Conductors, according to this theory, are bodies whose molecules have the power of communicating their electricities to each other at low tensions, whilst non-conductors are those whose molecules only acquire this power at high tensions. Wheatstone has shewn, as we shall afterwards see, that facility of discharge is not perfect even in the best conductors, as time is needed for its propagation, and it has been found that the terminal laminæ of non-conductors between two charged plates, become penetrated with opposite electricities, which indicates the slow progress of conduction. The molecules of conductors and non-conductors, therefore, have the same power of mutual discharge, but in very different degrees, so that a good non-conductor may be regarded as an excessively slow conductor. When disruptive discharge takes place through a non-conductor, the molecules in the line of discharge seem to be thrown into a state of very exalted tension, and to effect the discharge as if they formed a conducting wire.

*Distribution of Electricity.*—We might take it almost as a self-evident truth, that the greater the surface over which electricity is diffused, the less is its power or tension at any particular point, and so we are taught by experiment. When two equal balls are insulated, and a charge is given to one of them, and then communicated to the other by contact with the first, it is found that both equally divide the charge, but that the tension of the electricity of each is one half of that of the originally charged ball. When a watch guard-chain is charged and laid on the plate of an electroscope by means of a glass rod, the gold leaves diverge most when the chain lies in a heap on the plate; and as it is lifted up, the leaves approach each other, shewing that as the exposed surface of the chain increases, the electric tension of each part diminishes. We are thus taught that a large surface feebly electrified, is equivalent to a small surface highly charged with electricity. This can be accounted for by the theory of induction in the following way. It is assumed that electricity places itself where it can best propagate polarisation through the particles of the dielectric. In the case of the two balls, as each offered the same facility for induction, there was no distinction electrically between them, and an equal distribution necessarily took place. The polarising force, however unaltered in amount, having twice the number of dielectric molecules to act upon, can only effect half the amount of polarity in each. The same method of explanation may be adopted in all such cases.

Experiment teaches us, that electricity is exhibited only on the surfaces of conductors; this is shewn by the apparatus represented in fig. 5. A brass ball is suspended by a silk thread, and covered with two hemispheres, which can be held by insulating handles, and which exactly fit it. A charge

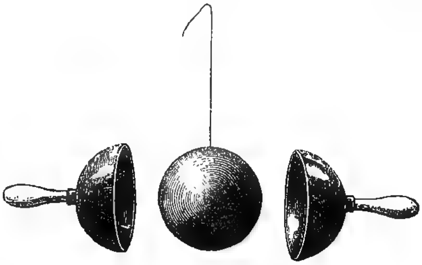


Fig. 5.

is then communicated to the ball so compounded. When the hemispheres are withdrawn, they are found to take away all the electricity with them, not the slightest charge being left in the ball. The same fact is exhibited by a hollow ball placed on a glass pillar, with a hole in the top large enough to admit a proof plane to the inside. When charged, not the faintest evidence of electricity is found on the inner surface, however thin the material of the ball may be. The thinnest metal plate, when under induction, shews opposite electricities on its two faces. We learn from these and numerous other experiments, that *electricity is only found on the outer surfaces of conductors in an envelope of inappreciable thickness.* This fact is quite in keeping with the theory of induction, for polarisation cannot be propagated towards the interior of a charged body which cannot possibly offer the corresponding opposite electricity, to complete the chain, and the outward polarisation can be manifestly best exerted on the very exterior, if we may use the phrase. This likewise accounts for no electricity being found on the inner surfaces of two gold leaves diverging under the same charge.

We are also taught, by experiment, that the distribution of electricity on the surface of insulated conductors is influenced materially by their form. An electrified ball, for example, exhibits the same tension on every part; and this we should expect, for there is no point *par excellence* where induction is facilitated. This, however, is not always the case, for when a conductor is brought near enough to the ball, the distribution is disturbed, being greatest towards the disturbing body, and least on the side away from it. If induction were propagated from the ball in the same way that light emanates from a candle, we should expect that the opposite electricity developed on adjoining surfaces ought to be of higher tension than on those more remote, in the same way that a body held near a candle is more strongly illuminated than more distant objects. The candle, however, does not shew itself brighter on the side next the near object—the distribution of its brightness is the same as before. But in the electrified ball we have a crowding of electricity towards the near object; so that we here learn a striking peculiarity in inductive action, viz., that it is most active where the dielectric channel is shortest. This holds true only for short distances; the disturbing body, for instance, in the case under consideration, has to be brought very near before any inequality in the distribution of electricity on the ball becomes manifest. It is to this concentration of electricity on the side of the approaching conductor that we owe the electric spark; and it is as we near the striking or sparking distance that this disturbance is revealed. The concentration or fixing of electricity on the side of the thinnest and best dielectric, is particularly illustrated in the Condenser (q. v.) and Leyden jar, whose action depends upon it; but in these the dielectric must be very thin to secure decided effect. When a conductor somewhat in the form of a prolate spheroid (fig. 6) is charged, and the electric tension of the several parts tested by the proof plane, it is found to be least at the thickest part, and to increase towards either end; and the difference is found to be all the greater as each end becomes more and more pointed. It is found likewise that the electric tension on a point is so great with a considerable charge as to destroy the dielectric condition of the air, the particles of which become electrified, and carry by convection the charge of the point to surrounding conductors. We therefore learn that *electricity concentrates on points and projections.* This is quite in accordance with the theory of induction. Suppose, for the instant, in the case of the spheroid, that the distribution was equable, and that the opposite electricity was induced on surrounding conductors, how would this react on the electricity of the spheroid? Let us compare the case of one of the small terminal surfaces with a corresponding one in the middle. The proportion of induced surface acting on the terminal surface is much greater than on the central one. This will be much better understood by supposing a microscopic spectator to stand in both positions. On the end surface, he would see nearly all the objects round about except the small portion hidden by the spheroid; whereas, on the middle surface, half of them is hidden by it. What he sees in each position, is the amount of induced surface acting on it. Hence the electricity is drawn more towards the ends, to correspond with the great inductive action there taking place. The same consideration accounts for the intense action of a point.

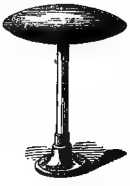


Fig. 6.

*Electrometers and Electroscopes.*—These words are generally taken as synonymous; electroscopes, however, should be applied to the instruments which give evidence of electrical excitement without giving the exact measure of it; and electrometers to such as shew both. Fig. 7 represents the *quadrant electrometer.* It consists of a conducting-rod, generally of box-wood or brass, with a graduated semicircle attached above, in the centre of which is a pivot for the rotation of a straw carrying a pith-ball at its outer end. It is used for electricity of high tension, such as that of the electric machine. When placed on the prime conductor of the machine, the whole becomes charged with + electricity, and the ball is repelled first by the electricity of the rod, and then by that of the prime conductor, the height to which it rises being seen on the semicircle. This is not an electrometer in the strict sense of the word, for although it tells us, by the straw rising and falling, when one tension is greater or less than another, it does not tell us by how much, the conditions of its repulsion being too complicated for simple mathematical expression. It can shew us, however, by the indicator standing at the same point, when the electric tension of the machine is the same at one time as another.

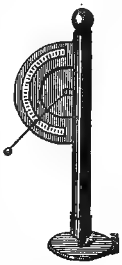


Fig. 7.

The *gold-leaf electroscope* is the most convenient instrument for testing electricity of feeble tension. One of the best of its forms is shewn in fig. 8. A glass ball, about four inches in diameter, rests on a brass tripod, and its neck, about an inch in diameter, is enclosed by a brass collar fixed with shell-lac. A brass plate, with a hole of ¼th of an inch in diameter in the middle of it, can be screwed air-tight into the collar. Before it is so fitted, a brass rod, ⅛th of an inch in diameter, is fixed by shell-lac or sealing-wax into the hole in the middle, so as to be perfectly insulated from it. The upper end of the rod ends in a brass ball, and the lower end is filed on each side, to allow of two strips of gold-leaf, an inch in length, being attached to

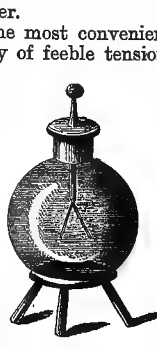


Fig. 8.

it. Before the plate and leaves are finally fixed, the interior of the ball is thoroughly dried, by passing hot dry air into it, so that the ball contains no moisture to carry away the charge of the leaves. When the plate is screwed to the collar, there is no communication between the included and external air. The insulation of the leaves is complete; and they keep their charge, in dry weather, for hours together. When the instrument is used, it may be charged directly, by contact being established with the ball and the body whose electricity we would examine, or a charge may be carried to it by the proof plane, when the leaves diverge according to the charge communicated. When we would ascertain simply the kind of electricity with which a body is charged, we proceed in the following way. A glass tube is rubbed, and brought into the neighbourhood of the brass knob; the leaves diverge by induction, and, when so diverged, the knob is touched with the finger, and the leaves fall to their original position, for they are then out of the line of action. In this state, − electricity is fixed by the action of the + electricity of the tube on the side of the knob next it, and the corresponding + electricity is lost in the ground. When the finger is removed, the + electricity is cut off, while the − electricity remains in the knob; and its presence is manifested by the leaves diverging permanently after the removal of the tube. If, now, a positively electrified body be brought near the knob, it draws away the − electricity from the leaves, and they consequently fall in; but if a negatively electrified body be brought near, it sends the − electricity more to the leaves, so that they diverge further. We are thus enabled to distinguish between a + and a − charge. But it may be asked, why not charge the electrometer immediately with the glass? There are two difficulties in the way of this. If the glass is powerfully electrified, it gives too great a charge; and if feebly, contact between the knob and the glass cannot be effected, although its electricity acts powerfully by induction. We therefore bring the glass rod near the electrometer, and when the leaves diverge sufficiently, we touch the knob with the finger, and withdraw first the finger, then the rod, and the leaves diverge as before. For the more delicate use of the gold-leaf electroscope, see Condenser.

*Coulomb's Torsion Balance* (fig. 9) has played an important part in examining the laws of electric forces. A glass canister A, is placed on a wooden frame, and is covered above by a plate of glass or wood; in the middle of this plate a round hole is cut, over which is fixed, by wooden fittings, a long glass tube B, having the graduated rim of a circle attached at its upper end. A circular plate, resting on this rim, closes the upper end of the tube; and when it is turned round, a mark upon it tells the number of degrees through which it has been moved. A cocoon thread or very fine wire is tied to a hook in the centre of the lower side of this plate, and thence descends to the body of the canister. It carries below a collar of paper or other light material, in which a needle of shell-lac is adjusted, having a disc of gilt paper placed vertically, or a gilt pith-ball at its one end, and a counterpoise at its other. When the plate above is moved through any number of degrees, the needle below, impelled by the torsion of the thread, comes to rest at the same number on the scale below. This last consists of a strip of paper divided into degrees, pasted round the cylinder at the same height as the needle. In the cover of the canister there is another opening, for the admission of a ball insulated at the end of a rod of shell-lac, and which, when supported by the cover, is on a level with the paper disc of the needle. When the instrument is adjusted for observation, the mark on the upper plate and the paper disc stand each at the zero-points of their respective scales, there being of course no torsion in the thread. The ball is removed, to receive a charge from the body under investigation, and is then placed in the cylinder, when the disc is first attracted, then repelled. Suppose that the disc be driven 40°, as shewn by the lower scale, from the ball, and that the upper plate has to be moved in the opposite direction, through 160° of the upper scale, to bring it back to 10°, the total degree of torsion is 160° + 40° = 200°. If the ball and disc be now discharged, and another charge be given to the ball, which requires 250° of torsion to place the disc at 10°, we have the relation 200 to 250, as that of the repulsive forces of the two charges, for the amount of torsion in degrees is proportional to the twisting force. Without entering further into detail, we may state the two laws that Coulomb established by this instrument: *The intensities of the mutual repulsion or attraction of two invariable quantities of electricity of the same or different names, are in the inverse ratio of the squares of the distance at which these act. The intensities of the total repulsive or attractive action of two electrified bodies placed at an invariable distance, are proportional to the products of their electric charges.*

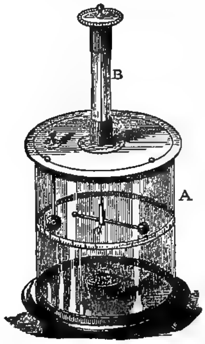


Fig. 9.

*Electric Machine.*—In the tube of glass and silk rubber of which we have made frequent mention, we have the embryo of the electric machine, viz., a body which, when rubbed, is positively electrified, and its rubber negatively. The first requisite we should expect in a *machine* of this nature is a large surface, to give a great amount of electricity. But there is another already casually referred to: glass being a non-conductor, the electricity formed on its surface has not a combined action, so that some arrangement is necessary to collect it, and render it available—to act, in fact, as its conducting reservoir. This portion of the machine is denominated the *prime conductor*. The

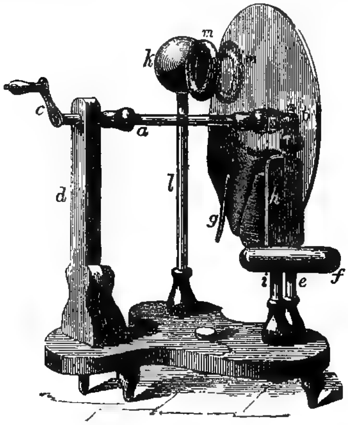


Fig. 10.—Electric Machine.

rubbed surface of the electric machines is either a cylinder or plate of glass, hence we distinguish them into cylinder machines and plate machines. The former, from their more compact form, are the more manageable; and the latter, from both sides of the glass plate being rubbed, are the more powerful forms of the instrument. The description of Winter's plate machine (fig. 10) will be quite sufficient to shew the general requirements and construction of electric machines. It was designed by Carl Winter of Vienna, and its merits, as well as those of some of the best forms of electrical apparatus, have been made widely known by two well-known German works, Müller's *Physik* and Frick's *Physikalische Technik*. The Edinburgh makers have been lately led to adopt it. It is one of the best existing forms of the machine. The glass plate is turned on the axis *ab*, by means of the handle *c*. The longer end of this axis, consisting of a glass rod, moves in the wooden pillar *d*, and the other rests in the wooden head of the glass pillar *e*. The plate is thus completely insulated, and little loss of its electricity can take place through its supports. The two rubbers, one of which is shewn on the outside, in fig. 11, are triangular pieces of wood, covered with a padding of one or two layers of flannel, enclosed in leather, and they present a flat hard surface to the glass, so that friction between it and them takes place in every part. They are placed in a wooden frame on each side of the plate, and the pressure is regulated by metal springs, fixed to the outside, between them and the frame. Before use, they are covered with an amalgam of mercury, zinc, and tin, which is made to adhere with the aid of a little grease, and which increases immensely the production of electricity. The surfaces of the rubbers are therefore conducting, and are made to communicate by strips of tinfoil with the *negative conductor f* (fig. 10). To prevent the electricity of the glass from discharging itself into the air, before reaching the prime conductor, each rubber has a non-conducting wing fastened to it, which is made of several sheets of oiled silk, kept together by shell-lac varnish, beginning at the rubber with several, and ending with one or two sheets. When the machine is in action, electrical attraction makes them adhere to the plate; but when it is out of action, they may be kept up by a split pin *g*. As the plate turns, the rubbers are kept in the frame by their ledges *h*. The whole framework of the rubbers and negative conductor is supported by the short glass pillar *i*, so that it can be insulated when required. The prime conductor *k*, is a brass ball insulated on the long glass pillar *l*, and to prevent the edges of the ball at the junction dissipating the electricity, the pillar enters the ball by a trumpet-shaped opening. The collection of the electricity from the glass is made by a row of points placed in the grooves, inside of two wooden rings *m*, *m*, which are attached on each side of the plate to a piece of brass projecting horizontally from the ball of the conductor. The grooves are covered with tinfoil, which conveys the collected electricity to the ball, and the points are kept out of the way of injury by not projecting beyond the grooves.

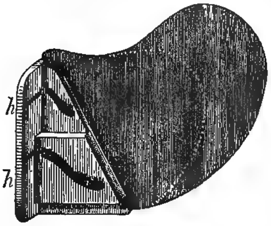


Fig. 11.

A section of the ball of the prime conductor is shewn in fig. 12. There are four openings into it: the lower one for the head of the supporting pillar; the one at the right for the attachment of the collecting apparatus; the one at the left for the stalk of a small brass ball; and the upper one for admitting the lower end of a large wooden ring, removable at pleasure. This last forms the peculiar feature of Winter's machine. It consists of an iron wire bent into the shape shewn in the figure, carefully covered all round with polished wood, and communicating by a brass pin at the foot of the stalk on which it stands with the prime conductor. To receive the sparks from the machine, an appendage (fig. 13) termed the spark-drawer is provided. This consists of a wooden pillar of the same height as the prime conductor, in the head of which a brass rod slides, with a large flat ball at the one end and a small ball at the other. All the fittings of the machine are of wood, no metal being used but for the prime and negative conductors. The loss caused by metal fittings in ordinary machines is very considerable. The insulating pillars should be, if possible, of green glass, which, from the absence of lead, is less conducting than flint glass. It is desirable, likewise, to cover them with shell-lac varnish, which prevents the formation of a conducting layer of moisture on them from the atmosphere. On using the machine, it is first necessary to connect the negative conductor by a wire or chain with the ground. As the plate is turned, − electricity is developed on the rubbers, and led to the negative conductor; and + electricity is formed on the glass, which is collected by the points, and transferred to the prime conductor. If the negative conductor were insulated, the electricities of both conductors, being of opposite names, and equal in amount, would act inductively on each other, so that the + electricity of the prime conductor would be to a considerable extent bound by the − electricity of the other conductor. When the latter is connected with the ground, its electric tension is no higher than is due to the inductive action caused by the prime conductor, which at the distance is not great, so that the electricity of the prime conductor is free to throw itself on the objects presented to it. To lessen this attraction, and at the same time to insure the insulation of the + electricity, both conductors are placed as far apart as possible, the distance in Winter's machine being nearly the diameter of the plate. If − electricity is wanted, the negative conductor is insulated, and the prime conductor connected with the ground, when sparks of − electricity are given off by the negative conductor.

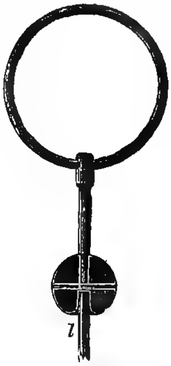


Fig. 12.

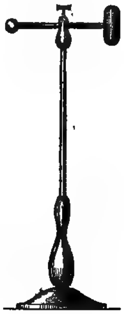


Fig. 13.

The various forms of *electric discharge* through the air, or, as it is termed, *disruptive discharge*, can be well seen with Winter's machine. The negative conductor being connected with the ground, with a two-foot plate, we may observe them in the following order. On turning the plate once or twice, a faint snapping sound is heard, and, when the room is darkened, a flickering spark is seen to be thrown out from the two-inch ball projecting from the prime conductor, which has the form of a bush, without leaves, with trunk, branches, and twigs, about ten inches in height. This is one form of what is called the *brush discharge.* Its general direction is horizontal, or not much inclined from it, but it turns to the hand or other flat conductor brought near it. If it be received on a ball, its various branches concentrate on it. If the brush proceed from the end of a brass rod, instead of from a ball, it becomes very much diminished in size, and resembles a brush of feathers. The brush discharge, though apparently continuous, has been found by Wheatstone to consist of a series of successive brushes. When discharge is effected from a point, a star or *glow* of light marks its termination, while strong currents of air proceed from it, which are strong enough to blow away the flame of a candle. These currents accompany more or less the various forms of the brush discharge. The particles of air thus carry away the charge from a point to surrounding conductors, and hence a point is said to discharge itself by convection. If we connect the brass rod of the spark drawer with the ground, or the negative conductor, and bring the flat ball opposite to the small ball on the prime conductor, straight brilliant sparks pass between them so long as the distance does not much exceed two inches. Beyond that distance, the sparks become somewhat crooked, and at about four inches the discharge begins to take the form of a brush. If, now, the ring be placed in the conductor, the sparks again pass with readiness, and the brush does not again take place till the ball of the spark drawer is eleven or twelve inches off. The long sparks thus obtained with the aid of the ring are decidedly crooked or forked, with strongly marked lateral branches, which become all the more marked as they lengthen. It would thus seem that the spark has a tendency to break up into branches. When the striking distance is small, this is not perceptible; it is then straight and undivided. As the distance increases, it is crooked, with well marked offshoots; and when the distance is too great, it splits up entirely into a bush or brush.

The function of the ring of Winter's machine is therefore to increase enormously the length of the spark. This would seem to arise in the following way: quantity as well as high tension of electricity is requisite for the long spark. Without the ring, the electricity collected on the prime conductor concentrates on the projecting ball, but it cannot gather strength enough to make a full discharge into the neighbouring spark drawer, for before the quantity is sufficient, the tension of the electricity on the small ball has pushed the polarisation of the molecules of air to their utmost, and a partial or overflow discharge in the form of a brush ensues. When the ring is added, from its thinness and prominent position, it diverts the electricity into it; and before the tension of the electricity on the small ball again rises to discharging point, a large charge is accumulated in the compound conductor, which finds full vent in a powerful and concentrated spark. The wooden envelope appears to act to the core as the oiled silk to the plate; it prevents discharge into the air. The influence of the large flat ball of the spark drawer is of importance; it concentrates, from its size, the inductive action of the charge on itself, and from its flatness it cannot hasten a premature discharge. Long sparks do not necessarily imply a very powerful machine, but they guarantee good production of electricity, and an insulation so perfect that no power is squandered. For the generality of electrical experiments, sparks of one or two inches are amply sufficient. These, Winter's machine gives readily without the ring; and when occasionally long sparks are wanted, the extension of the prime conductor can be added without inconvenience. It might be supposed that while the long sparks pass, the machine works more powerfully than at other times; but such is not the case, for the long spark occurs only occasionally, and the short one almost incessantly. All the forms of disruptive discharge are accompanied with the peculiar electric odour which arises from the production of ozone (q. v.).

We may now make a short reference to the experiments performed by the machine, illustrative of the general properties of electricity. A wooden head with hair on it illustrates, when placed on the prime conductor, electrical repulsion, by the hairs standing on end. A spoon containing ether is held so as to receive a spark from the projecting ball, when the inflammation of the ether illustrates the heat of the spark. A man standing on an *insulating stool* (a stool with glass legs), with one hand on the conductor, can send sparks, with his other hand, to everything and everybody about him. This illustrates communication of electricity by contact. A few pith-balls are enclosed in a glass jar, having its top and bottom of metal—the former in connection with the prime conductor, and the latter with the ground, when the pith-balls, by their rising and falling, shew the attraction of unlike, and the repulsion of like electricities. The most extraordinary experiment that can be performed with Winter's machine, is the lighting of a gas-jet by a person wholly unconnected with the machine, and standing some eight or ten feet from it. If the person so situated holds the blade of a knife or other point over the gas-burner, at a distance only short of touching, at each long spark from the machine, a small spark passes between the blade and the burner, and this ignites the gas. The reason is as follows: The body of the person in question is electrified negatively by the extensive prime conductor of the machine acting inductively. When the spark passes, the electric tension of the ring falls, and the negative electricity of his body must return to the ground, and taking the easiest route, causes the spark in question. This is quite similar to what is known in thunder-storms as the *back-stroke.* A person in a prominent position, under a highly charged cloud, experiences a violent, sometimes fatal shock at the same time as a flash of lightning, although the flash was not at all near him.

*Leyden Jar.*—This is a glass jar (fig. 14), with a coating of tinfoil pasted carefully inside and out, extending to within a few inches of the mouth. This last is generally closed by a wooden stopper, through which passes the stalk of a brass knob or ball, surmounting the whole. The connection between the inside coating and the ball is completed by a chain extending from the stalk to the bottom of the jar. If this jar be put on an insulating stool, so that sparks can pass from the prime conductor of a machine to the knob, when the jar is thus insulated, one or two sparks pass, and then the charge seems complete, for no more sparks will follow, though the action of the machine is continued; or

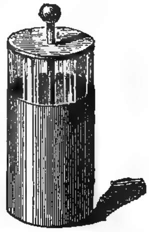


Fig. 14.

if they do, they are immediately dissipated from the knob in a brush discharge. If then, however, the knuckle of the experimenter be brought near the outer coating, sparks begin again to pass freely; and for every spark of + electricity that passes between the machine and the knob, a corresponding spark of the same name passes between the knuckle and outer coating. This continues for some time, and then the jar appears to be again saturated. It is now said to be fully charged. The outside of the jar can, in this state, be handled freely, and if it be still on the insulating stool, so may also the knob, although, when the hand first approaches, it receives a slight spark. But if, when the experimenter has one hand on the outer coating, he bring the other hand to the knob, before it can reach it, a straight, highly brilliant spark passes between the knob and his hand, and he experiences a shock of great violence. If he try the same thing again, a feeble spark and shock again ensue, and the jar is now thoroughly discharged. As it is highly inconvenient, if not dangerous, to discharge the jar through the body, *discharging tongs* (fig. 15) are used for that purpose, which consist of two brass arms ending in balls, and moved on a hinge by glass handles.

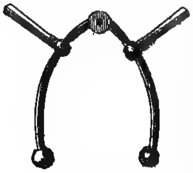


Fig. 15.

The following account may be given of the action of the jar: When a spark passes between the conductor and the knob, the + electricity thereby communicated to the inner coating induces polarity in surrounding conductors, the — electricity being turned towards itself. From the knob, it can act upon a wide but distant range of conductors, through the air as the dielectric; and through the glass as dielectric, it can act upon the outer coating. Now, as the outer coating is very much nearer than other conductors, and as glass is a better dielectric than air, by far the most important direction of induction, when the jar is uninsulated, is through the glass. We have, therefore, the electricity given to the knob and inner coating divided, as it were, into two inducing charges—one to the further conductors, and the other to the outer coating. The former of these we may call the free charge, as it acts in the usual way through the air; and the latter, the bound charge, for it has a special conductor and dielectric. When the jar is insulated, we find that, after one or two sparks, it refuses to take more. This comes from the outer coating refusing to be further polarised, or, which is the same thing, the insulated electricity can more easily transmit polarisation to surrounding conductors through the knob than by means of the + electricity induced on the outer side of the outer coating. When, however, the outer coating is connected with the ground, either by spark or contact, the polarisation can reach its final termination, the ground, much more easily through the thin sheet of glass than through the air, so that every spark that the jar now receives goes, for the most part, to the bound charge, and a small fraction only to the free charge. What goes to the bound charge must have a corresponding — electricity on the outside coating; and for every amount of — electricity thus fixed on the outer coating, a corresponding amount of + electricity must be sent from the outer coating, either silently, when in contact, or by spark, when nearly so, into the ground; and what goes to the free charge has its — electricity imperceptibly induced in surrounding conductors. The jar thus receives rather more + electricity inside than — electricity outside; the latter, however, being by far the largest fraction of the total — electricity induced. After a few more turns of the plate, a second limit is reached, and the sparks refuse again either to travel or to be retained. This arises from the air offering an easier channel for induction than the glass, the particles of which now offer more resistance to further polarisation than those of air to a disruptive discharge. The thinner the jar is, the longer must it be before this state of things ensues, for induction prefers the shortest channel. If the glass could be made of indefinite thinness, it would offer perfect facility for induction, and other conductors would not then come into competition with the outer coating. The free charge could not consequently exist, and there would be no limit to the charge which the jar could receive. Practically, however, we must make our jars of some thickness, and that we find must not be too small, for as the glass gets thinner the polarisation of its particles rises higher; and when it is too thin, the polarisation rises higher than the cohesion of its particles can bear, and a disruptive discharge takes place through it. Such a *spontaneous discharge* sometimes occurs with ordinary jars at their thinnest part; and as the fracture which it there causes in its passage makes the jar useless, it is usual not to charge a jar to saturation. The beau-ideal of a Leyden jar would be one whose dielectric was of excessive thinness and insulating power, a condition manifestly unattainable. The two charges are bound by mutual attraction to each side of the glass; but if both coatings could be simultaneously removed, as in the condenser, each would give striking evidence of its high electric tension. The outside coating can be touched without shock, for the — electricity is next the glass, and the + electricity has been lost in the ground, of which the outer surface of the coating, as well as the hand, forms a part. The inner coating, or its representative knob, may not be touched while the jar is uninsulated, for the discharge of the two coatings would be effected through the ground and body. When it is insulated, it may be touched, after, however, receiving a small spark, arising partly from the discharge of the free charge, and partly of a minute portion of the bound charge, arising from the nearness of the hand at contact increasing the amount of the free charge at the expense of the previously bound charge. The electricity is, as in the case of the outer coating, next the glass; and the knob and visible surface of the inner coating forms, as in the former case, a portion of the ground. But the minute loss of bound + electricity from the inner coating leaves a corresponding amount of — electricity free in the outer coating, which, when taken away, is, as before, accompanied by a minute portion of the bound charge; and thus, while the jar is insulated by touching alternately the knob and the outer coating, we gradually discharge it. When we wish to discharge the jar with the tongs, we place one ball on the outer coating, and bring the other round to the knob, when the discharging spark takes place. The length of this spark is many times longer than the thickness of the glass, which shews that a discharge takes place more easily through the air than through a glass plate of much inferior thickness.

On bringing the ball of the tongs, after the first discharge, nearer to the knob, a feeble *secondary discharge* follows, arising from the electricity which, under the intense action, had penetrated the glass, in the endeavour to force a conducting passage through it, being partially left in it. It is to this state of conduction into which the surfaces of the glass are forced, that we may attribute the fact, that the charge appears to lodge more on the glass than on the coatings, the latter merely serving to aid in giving completion to their semi-conducting state. This is usually illustrated by a jar with movable coatings, which, when charged, can be taken to pieces. The jar being insulated, the inner coating is first removed, then the jar is lifted from the outer coating. Both coatings being completely discharged, the whole is again put up, and a discharge of very considerable power is obtained.

With respect to the striking distance, or that through which the air-discharge takes place, it has been found that it is proportional to the amount of the charge, and inversely proportional to the extent of the coatings. Thus, when a jar is half charged, the striking distance is half what it is with a full charge; and to keep the same striking distance for a jar of twice the size, a double charge is necessary. The amount of the charge is correctly enough known by the number of turns of the plate of the machine. When great accuracy is wanted, the outer coating of the insulated jar is made to spark into the knob of a small jar, whose outer coating is connected with the ground, and which is so made that its two coatings can discharge themselves. Each discharge of the small jar measures so much electricity fixed on the large jar; such a measurer is denominated a *unit jar.*

For great power, large surfaces are necessary. This can be obtained either by constructing a large jar or by uniting several small jars together, so as to act as one. The latter method is preferable, as we can vary the surface according to the number of jars employed. A combination of small jars united together as one is called an *electric battery.* A very convenient form of electric battery is shewn in fig. 16. The knobs of each jar communicate with a large central one by means of arms of brass moving on hinges, and the outer coatings are put in conducting connection, by being placed on an insulated stool covered with tinfoil. The interior coatings are conveniently charged by a long projecting arm from the central knob, and the exterior ones by connecting the stool with the knob of the unit jar, or by a wire with the ground. Any jar can be thrown out of action by throwing back its arm.

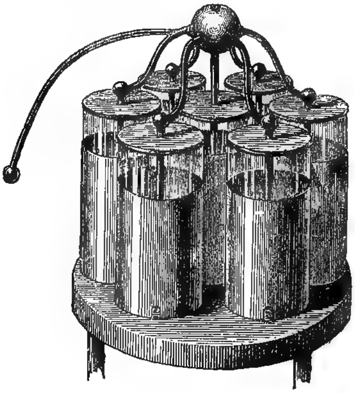


Fig. 16.

By discharging the Leyden jar or electric battery through particular channels, we obtain some beautiful illustrations of the power of electricity. When the discharge is effected through thin wires of gold or platinum, the heat accompanying its passage is so great as to dissipate them in vapour. The expansion of the air caused by the spark is shewn by the *electric mortar.* This is a wooden mortar with two wires entering air-tight at the opposite sides of the breach, with a small wooden ball fitting closely in the muzzle. The spark passing between these wires in discharge causes a sufficient expansion of the air within the mortar to drive the ball to some distance off. When the discharge is made through gunpowder, it tosses the grains violently about, but causes no ignition; when, however, it is retarded by introducing an imperfect conductor, such as a wet string, into the circuit, the gunpowder is fired. When the discharge is made through glass by two points pressing against its opposite surfaces, a small hole is drilled into the glass. To assist in such experiments, the universal discharger (fig. 17) is used. This consists of two arms of brass mounted on glass pillars, so that their position and distance can be easily adjusted, and of a small movable table placed between them, the whole resting on a wooden foot.

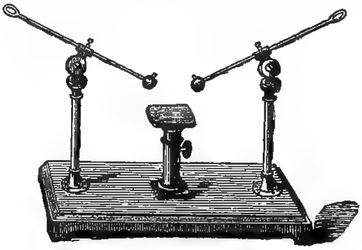


Fig. 17.

*Velocity of Electrical Discharge.*—The rapidity with which electrical discharge takes place is so great, that we might well despair of reaching any definite information about it. Wheatstone, by means of a revolving mirror, determined its rate of propagation in certain circumstances. A small mirror was made to revolve fifty times a second, and the reflection of the electric spark was observed in it. Any one who takes a mirror in his hand and makes it revolve, sees that objects are apparently displaced by it, and it admits of an easy geometrical demonstration, that the reflected image describes an angle the double of that of the mirror. If, while the small mirror rotates at this rate, the image of a spark should shew a displacement of 90°, we know that the mirror has moved through 45°, and the time during which this takes place is $\frac{45}{360}$ of $\frac{1}{50} = \frac{1}{400}$ of a second. If the duration of the spark, then, had been $\frac{1}{400}$ of a second, we should have seen its image move through 90°. The eye, however, during this time would not have been able to discern any difference between the beginning and the end of the spark, so that the 90° would have appeared as one arc of light. Examined in this way, however, the spark of a machine and of a Leyden jar were seen as if the mirror had been at rest. Thus analysed with an apparatus where a duration of $\frac{1}{36000}$ part of a second would have shewn an arc of 1°, the electric spark appears instantaneous. The discharge of a Leyden jar through a long wire is not so instantaneous. Wheatstone's method of finding this was as follows: Six balls (fig. 18) were arranged in pairs, each pair being quite near the other. The ball 2 was connected with 3 by a copper wire a quarter of a mile in length, so were also 4 and 5—the dotted lines in the figure marking simply the connection. When discharge took place, the electricity of the inner coating was

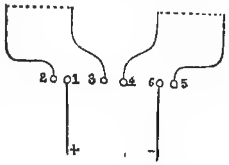


Fig 18.

communicated to 1, and of the outer coating to 6. Supposing charge to travel from the inner to the outer coating, it would proceed from 1 to 2 by spark, then by the long copper wire to 3, by spark to 4, by the other long wire to 5, and by spark to 6. To the eye, the three sparks seemed simultaneous. In the mirror, however, they presented the appearance of three arcs of equal length, the middle one rather behind the others (fig. 19). In this instance, the mirror revolved 800 times a second, and the retardation of the middle line was about ½°. The time, therefore, taken by the discharge to travel from 2 to 3, or 5 to 4, a quarter of a mile, was $\frac{\frac{1}{4}}{360} \times \frac{1}{800} = \frac{1}{1,152,000}$ of a second, which corresponds to 288,000 miles per second; greater than the velocity of light, which is only 194,000 miles per second. In the same manner, it was calculated from the lengths of the arcs, which were 24°, that the duration of each spark was $\frac{1}{24000}$ of a second. It thus appeared that the discharge was a successive one, not, at least, as instantaneous as through a short conductor. This prodigious velocity is only that of discharge, not that of electric action. The fact of both side-sparks occurring at the same instant, shews that induction must have been fully established along the whole line before discharge took place. One would imagine, from the dual nature of electric force, that the velocity of induction must be indefinitely great.

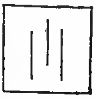


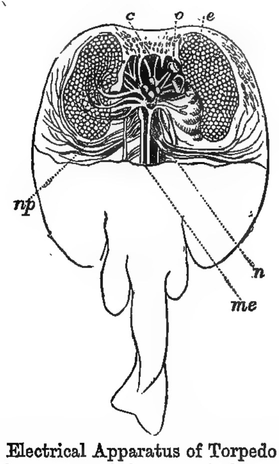
Fig. 19.

*Electric Theories.*—There are two theories which have played an important part in the history of the science—the two-fluid theory of Dufay, and the one-fluid theory of Franklin. According to the former, matter is pervaded with two highly elastic imponderable electric fluids—one, the vitreous; the other, the resinous. These are supposed to repel themselves, but attract each other. Neutral bodies give no evidence of their presence, for they are there neutralised the one by the other; but when by friction or other operation the fluids are separated, each body observes the attractions and repulsions of the fluid it happens to have. According to the latter, there is only one electric fluid which repels itself, but attracts matter. Friction determines a gain of the fluid to the positive, and a loss to the negative body. Of the two theories, Dufay's is generally preferred, because the perfect similarity of each electricity, separately considered, is better represented by two similar fluids, than by a fluid on the one hand, and matter on the other. Either theory can give a graphic explanation of electric phenomena; but this does not necessarily imply their truth, for any theory which made allowance for the double nature of electric force could not fail to be in some degree satisfactory. It is extremely questionable whether electricity is a fluid at all. It is true that the distribution of electricity on the surfaces of conductors is that of one of the fluids supposed; but to act as a fluid, and to be a fluid, are two very different things, and something more is needed than mere analogy to prove electric fluidity. If such a fluid existed, we might expect to have some traces of its separate existence; but experiment teaches us that electricity is never manifested or transmitted apart from ponderable matter. It is difficult to conceive of fluids of the nature supposed. They are, in fact, quite as peculiar as the phenomena which they are intended to explain; still, the science of electricity is very much indebted to the supposition of its fluidity. It has served to lessen the abstractions of the science, and to simplify the comprehension of phenomena, much in the same way that the balls of an abacus, though not numbers, facilitate calculation by being dealt with as such. Electricity appears as a peculiar affection of matter, but we are yet quite at sea as to the essential nature of that affection.

**ELECTRICITY,** Animal. In this article we shall notice (1) the electricity developed by the so-called electrical fishes; (2) the electric properties of muscle and nerve; and (3) the electric phenomena of membranes and glands.

1. Although the peculiar powers of the torpedo and of the gymnotus were well known to the ancients, the first scientific discovery in this department of electricity was the determination of the electrical character of the shock of the torpedo by Walsh in 1772 ('Of the Electric Properties of the Torpedo,' *Phil. Trans.* 1773). From that date to the present time, the electric organs of certain fishes, which will be immediately mentioned, have been made the object of special study by some of our greatest anatomists and physiologists, amongst whom may be named John Hunter, Galvani, Rudolphi, Knox, Valentin, Pacini, Matteucci, Goodsir, and Jobert de Lamballe, who has published a special work, entitled *Des Appareils Electriques des Poissons Electriques* (Paris, 1858), accompanied by a magnificent volume of Plates.

The species of electrical fish which has been the longest known, is the *Raia torpedo,* or electric ray, which has much the appearance of a skate. It is common in the Bay of Biscay and in the Mediterranean, but is seldom met with on the shores of Britain. It grows to a considerable size, and is often above 80 lbs. in weight. It is now usually regarded as not a true ray, but as constituting a distinct genus, to which the terms *torpedo* and *narcine* have been applied by different naturalists—the latter name being derived from the Greek word *narke,* which was given to it by Aristotle. The electric organs or batteries are placed on each side, in the spaces between the pectoral fins, the head, and gills. See Torpedo. Each battery consists of a number (varying according to the age of the animal) of hexagonal prisms, which extend perpendicularly between the dorsal and abdominal surfaces, and present somewhat of a resemblance in shape and arrangement to the cells of a honey-comb. Four nerves, which are branches of the fifth and eighth cerebral pairs, go to each battery; and the



Electrical Apparatus of Torpedo:
*e,* the electric organs; *c,* hair; *me,* spinal cord; *o,* eye and optic nerve; *np,* pneumogastric or eighth nerve; *n,* spinal nerves.

nervous centre of the electrical apparatus is, therefore, the *medulla oblongata*. Several species of *narcine* are known, all of which possess the electric property.

The ordinary rays and skates possess an organ in the tail which closely resembles the electric organ of other fishes, but its function is still doubtful; and in opposition to the view of its electric nature, it may be mentioned that while Dr Starke (to whom the discovery of this organ is due) found it in the tail of every species of true ray, both Professor Goodsir and M. Robin ascertained it to be wanting in the tail of the *torpedo*.

The *Gymnotus electricus*, or electrical eel, is little inferior in celebrity to the *torpedo*. It is common in all the streams which flow into the Orinoco, and is generally procured from Surinam. It is usually three or four feet in length, but may reach a length of six feet. The whole of its viscera lie close to the head, and the anal aperture is only two inches behind the mouth; all the rest of the body inferiorly is occupied by the electrical apparatus, which consists of four batteries—viz., two on either side, and one above the other—the uppermost or dorsal being the larger. These batteries consist of a number of piles placed horizontally in a direction from head to tail; and from this circumstance, as well as from their peculiar structure, they were compared by Redi to galvanic troughs. The number of these piles in the greater battery, is from thirty to sixty; in the lesser, from eight to fourteen. These batteries are supplied by about 224 pair of nerves on each side, derived from the inferior or motor roots of the spinal nerves.

Humboldt, both in his *Personal Narrative* and in his *Views of Nature*, gives a graphic account of the mode in which the Indians catch wild horses through the agency of the gymnotus. Faraday made numerous observations on a specimen, forty inches in length, which was exhibited in the Adelaide Gallery some years ago. He calculated that, at each medium discharge, the animal emitted as great a force as the highest charge of a Leyden battery of fifteen jars, exposing 3500 square inches of coated surface. The strongest shocks were obtained by touching the fish simultaneously near the head and near the tail; scarcely any shock being felt if the hands be placed, one on each side of the fish, at the same distance from either extremity; the amount of the shock, as might have been expected, varying with the length of the column which produces it. The shocks have sufficient power to stun, or even to kill fish; and the same discharge produces a more powerful effect upon a large fish than it does upon a small one, since the larger animal exposes a larger conducting surface to the water, through which the electricity is passing, and, consequently, it receives a more violent shock. On one occasion, when a live fish was put into the tub, which was 46 inches in diameter, the animal was seen to coil itself into a semicircle, the fish lying across the diameter; this was the most favourable position for giving the strongest shock; an instant afterwards, the fish floated dead upon its side, and was then devoured by the *Gymnotus* (q. v.).

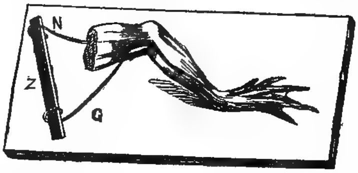
The shock of both the *torpedo* and the *gymnotus* gives rise to momentary currents of sufficient intensity to deflect the galvanometer, to magnetise a needle, and to decompose iodide of potassium; and from both fish, sparks have been obtained.

We next come to the electrical fishes of the genus *Malapterurus*. The only fish of this genus whose electrical organs have been examined and described, is the *M. electricus* of the Nile, called Raash or Thunder-fish by the Arabs. It has barbules dependent from the region of the mouth, like the common barbel; and its smooth skin is diversified with irregularly shaped spots. Its length is from eight to fourteen inches. The batteries are two in number, 'separated,' to adopt Professor Goodsir's description, 'but at the same time intimately connected to one another in the mesal plane along the dorsal and ventral margins of the body, so as to form a continuous layer of a gelatinous consistence closely adherent to the skin, and enclosing as in a sac the entire animal, except the head and fins.' The structure of these batteries is very complicated, and we shall not attempt to explain it.

In the year 1854, a new electrical fish became known to us, belonging to the same genus as the one just described. It is found in the muddy brackish water of the river Old Calabar, which empties itself into the Bight of Benin. The fish has, accordingly, been named the *Malapterurus Beninensis* by Mr Andrew Murray, who has described and figured it in the *Edinburgh Philosophical Journal* for July 1855. It is much smaller than the Nilotic species, and the formulæ of the number of fin-rays differ in the two species. We believe that this new species has been dissected by Professor Goodsir, but we are not aware that the results have been published. See MALAPTERURUS.

Our limits will not allow of our noticing the successive opinions which have been entertained regarding the action of the electric organs in fishes. Those of our readers who wish to investigate this abstruse subject, may be referred to Professor Goodsir's memoir, 'On the Present State of Organic Electricity,' in the *Edinburgh Philosophical Journal* for October 1855. We cannot conclude our notice of electric fishes without directing the attention of our readers to an extremely interesting memoir by the late Professor George Wilson, 'On the Electric Fishes as the earliest Electric Machines employed by Mankind,' which is contained in the *Edinburgh Philosophical Journal* for October 1857, in which he discusses (1) the antiquity of the practice of using the electrical fishes as remedial agents, and (2) the extent or generality of that practice.

2. The study of the electrical properties of muscle and nerve dates from the period (1786—1794) in which Galvani made his great discoveries. Having first ascertained that contractions were produced by electricity in the muscles of a recently killed frog, he subsequently found that similar contractions occurred when two dissimilar metals in contact with one another were brought in contact with the nerve and muscles respectively of the frog's leg. The experiment may be readily made in the following manner: Expose the crural nerve, N, of a recently killed frog; touch it with a strap of zinc, Z, and at the same time touch the surface of the thigh with one end of a bit of copper wire, C. At the moment that the other end of the wire is brought in contact with the zinc, the limb is convulsed; but the convulsions cease when the two metals are separated from each other, though they are still in contact with the animal tissues; and they are renewed when the zinc and copper are again made to touch. At first, Galvani believed that the contractions were due to electricity evolved by the



metals, but finally he concluded that it is produced by the animal textures themselves. No important step in this direction was afterwards taken till 1827, when Nobili, with his improved Galvanometer (q. v.), discovered the electric current of the frog. He found that when the circuit of the nerve and muscles of the leg is closed by the instrument, a deviation of the needle, to the extent sometimes of 30°, occurs, due to a current which passes in the limb from the toes upwards, and which could be increased when several frogs were simultaneously included in the experiment. Undoubted proof was thus afforded that electricity is developed in connection with muscle and nerve.

The researches of Matteucci, confirmed by the subsequent investigations of Dubois Reymond, have demonstrated the existence of what is termed *the muscular current* in living animals. They shew that in the living animal an electrical current is perpetually circulating between the internal portion and the external surface of a muscle—a current due probably to the chemical changes which are always occurring in the animal tissues. This muscular current ceases in warm-blooded animals in a very few minutes after their death; but in cold-blooded animals, as in the frog, it continues for a much longer period. The following is perhaps the best experiment for shewing the existence of the muscular current. Five or six frogs are killed by dividing the spinal column just behind the head; the lower limbs are removed, and the integuments stripped off them; the thighs are next separated from the legs at the knee-joint, and are cut across transversely. The lower halves of these prepared thighs are then placed upon a varnished board, and so arranged that the knee-joint of one limb shall be in contact with the transverse section of the next, and thus a muscular pile is formed, consisting of ten or twelve elements; the terminal pieces of this pile are each made to dip into a separate small cavity in the board, in which a little distilled water is placed. If the wires of a sensitive galvanometer be attached to a pair of platinum plates, and these plates be placed simultaneously, one into each cavity in connection with the muscular pile, a deviation of the galvanometer needle will be observed in a direction which indicates the existence of a current passing from the centre or cut transverse surface of the muscle towards its exterior.

Dubois Reymond has subsequently shewn, by the use of extremely sensitive instruments, that even the smallest shreds of muscular tissue exhibit proof of the existence of such a current; and he has established the general law, that any point of the natural or artificial *longitudinal* section of a muscle is positive in relation to any point of the natural or artificial *transverse* section.

3. The electrical relation of membranes and glands have been especially studied by Mr Baxter, whose 'Experimental Inquiry, undertaken with a View of ascertaining whether any or what Signs of Current Electricity are manifested during the Organic Process of Secretion in Living Animals,' is published in the *Philosophical Transactions* for 1848 and 1852.

His chief conclusions regarding the electrical condition of the intestinal mucous membrane are:

1. When the electrodes of a galvanometer are brought into communication—one with the mucous membrane of the alimentary canal, and the other with the blood flowing from the same part—a deviation of the needle takes place, indicating that the mucous secretion and the blood are in opposite electrical states.

2. The effect ceases after death, and may be considered as arising from the decomposition of the blood—viz., from the changes which occur during the formation of the secreted product and venous blood.

His conclusions regarding the electrical relations of the secretions and blood of the liver, kidney, and mammary gland, are as follow:

1. During biliary secretion, the bile and the venous blood flowing from the hepatic veins are in opposite electrical states.

2. During urinary secretion, the urine and the venous blood flowing from the renal vein are in opposite electrical states.

3. During mammary secretion, the milk and the venous blood flowing from the mammary veins are in opposite electrical states.

For further information on this subject, the reader is referred to Matteucci's *Lectures on the Physical Phenomena of Living Beings*, translated by Dr Pereira; to his series of 'Electro-Physiological Researches,' published in the *Philosophical Transactions;* and to Dubois Reymond's *Untersuchungen über Thier-Electricität.*

**ELECTRICITY, MEDICAL.** Electricity, in its application to medicine and surgery, is employed in the following forms: 1. *Electrisation*, by electricity of high tension, as obtained by friction of glass in the common electrical machine; 2. *Galvanisation*, by current electricity of quantity, as set in motion by the voltaic battery; and 3. *Faradisation*, by induced or interrupted currents, produced by magneto-electric or electro-magnetic induction coil machines.

*Electrisation.*—Frictional electricity is now seldom employed in therapeutics, on account of the inconvenience experienced in the management and insulation of the glass or common electrical machines; yet the powerful stimulant and counter-irritative effect of sparks drawn from the affected parts is still recommended in paralytic affections, in Chorea and other nervous diseases; and the succussion produced by shocks from the Leyden jar is undoubtedly the most effectual remedy in Amenorrhœa.

*Galvanisation.*—The effect of passing a voltaic current from a battery of many elements through the living body, is to cause a shock or contraction of the muscular tissues, succeeded with a distinct interval by a momentary sensation or flow of heat due to the electric and nervous (?) polarisation of the circuit. During the continued passage of the current, slight tingling sensations and elevation of temperature are observed, especially in those parts in contact with the electrodes or poles, which become painful and congested, and finally inflamed and ulcerated. On opening the circuit, the depolarisation of the tissues which ensues is accompanied by a second shock and subsequent glow of heat, which are powerful in proportion to the length of time the circuit has remained closed. The amount of contraction in the muscle has relation to the *intensity* rather than the *quantity* of electricity passed through it—that is, to the rapidity with which the electric state is changed, rather than the amount of that change. The calorific effect of the current is proportionate to its *quantity.* Thus, a single pair of plates of platinum and zinc, an inch square (charged with chromic acid), will, under ordinary circumstances, exercise little or no physiological effect; but if the same pair be divided, so as to form a compound battery of twelve smaller pairs, its application will be attended with the shocks and calorific effects described. A further division into twenty-four or more pairs increases the shock, but the sensation of heat becomes less marked. With certain limitations, therefore, the shock of the battery depends on the number of its elements, without regard to their size, its calorific effect to the area of its plates. The nerves of the organs of special sense, when subjected to galvanisation, evidence phenomena peculiar to their proper function. Thus, the passage of the current through the retina is attended by the sensation of a flash of light, which is bluish when the positive pole is applied to the eye, and tinged with the complementary orange when the force is transmitted in the opposite direction. A faint sensation of light is also perceived when the skin of the face or mucous membrane of the mouth is galvanised, caused by reflex action from the sentient filaments of the fifth pair of nerves which are distributed to those parts. Galvanisation of the ear gives rise to bubbling, ringing, or cracking sounds, and occasionally to distinctly musical tones; that of the tongue, to an acid taste under the positive pole, and an alkaline taste under the opposite one; that of the lining membrane of the nose, to sneezing and a peculiar smell, which differs with the direction of the current. The continuous gentle action of small single and compound voltaic arrangements has been more or less successfully employed in paralysis, amaurosis, and neuralgia, either by application to the surface of the body, or carried directly to the affected parts by needles thrust into them (galvano-puncture). More powerful batteries, consisting of six or eight cells of the carbon battery of Bunsen, the nitric acid battery of Grove, or the platinised zinc battery of Strethill Wright, have been used to coagulate the fibrinous contents of aneurismal sacs—to decompose calculi in the bladder (?)—and to render platinum plates or wires incandescent, for the surgical cauterisation of internal parts not otherwise easily accessible.

*Faradisation.*—The instruments employed for the exhibition of interrupted or induced currents are the magneto-electric and the electro-magnetic coil machines. In the first, the electricity is set in motion in a long thin wire coiled round a bar of iron or keeper maintained in constant whirling motion before the poles of a permanent horseshoe-magnet, the magnet with every half revolution magnetising the keeper alternately in opposite directions, while the constantly recurring magnetism of the keeper in its turn induces impulses of alternating currents in the coil-wire. The disadvantages of the magneto-electric machine, therefore, are, that it is not self-acting, and that its currents pass alternately in opposite directions. In the electro-magnetic machine, the thick coil-wire, wound over a core of iron, is made to conduct the current from a single voltaic pair which magnetises the iron. When the battery-current is interrupted, the iron core becomes instantly demagnetised, and this change in its magnetic condition is attended with a rearrangement of the polarity of the coil-wire, and the passage through it of an impulse of induced electricity. By a simple arrangement, the magnetised iron is made to interrupt and renew the battery-current; and the machine thus rendered self-acting, furnishes a rapid succession of momentary currents passing in the same direction, and of much greater quantity than those of the magneto-electric machine. Currents higher in tension, less in quantity, and more resembling frictional electricity, may be obtained from an additional coil ('secondary coil') of very thin and long wire wound over the former one, but they are not of much importance in medical practice.

The physiological action of the coil-machines is equivalent to that of rapidly repeated discharges from a large Leyden jar weakly charged; and as the time engaged by the passage of each impulse in the succession of discharges is too short to permit the development of any decided polarisation of the tissues, the distinct calorific effects which accompany the commencement and cessation of the *galvanic* discharge do not occur. The continued passage of the interrupted currents acts chiefly as a mechanical stimulant, first exciting, and after a time depressing the vitality of the part in the circuit; and its effects have been very closely imitated by vibratory impulses, produced altogether irrespective of electrical agency.

Faradisation is applicable to a great variety of chronic diseases in which a deficiency of functional energy exists: in paralytic affections unconnected with active disease of the nervous centres, mercurial and lead palsy, and in that produced by rheumatic affection and exposure to cold; in nervous or hysterical Aphonia, or loss of voice; in Amaurosis (q. v.), when not connected with inflammatory or organic disease; in Nyctalopia, or night-blindness; in Amenorrhœa, when uncomplicated with active disease of the uterus; in suppression of the lacteal secretion; in Constipation (q. v.) from deficiency in the peristaltic action of the intestines; in Paralysis of the bladder (?), and with very doubtful effect in the induction of uterine contraction; in suspended animation from drowning, narcotic poisons, &c. In spasmodic and neuralgic diseases, the benefit of Faradisation is less to be depended on; but a very gentle and long-continued application of it has afforded relief in the distressing starting of the lower limbs which occurs in Paraplegia or Paralysis of the lower half of the body; in 'Writer's Cramp,' and spasmodic forms of Hysteria; in Tic-douloureux, Sciatica, and hysterical Neuralgia. Faradisation by electro-puncture has been successfully employed to induce the union of non-united fractures, the currents being passed between the disjoined ends of the bones; and to excite absorption in Bronchocele and Hydrocele, though with more doubtful effect. The intense sparks from the 'secondary coil' have been used in place of those obtained by frictional electricity; and lastly, it has been proposed to employ the brilliant streams from powerful induction coils confined in fine 'vacuum tubes' of glass, to illuminate internal parts of the body, for the performance of surgical operations, &c.

**ELE'CTRO-CHE'MICAL ORDER OF THE ELEMENTS.** In the action of gases, liquids, and solids upon each other, as in the construction of galvanic batteries, it has been observed that certain elements are readily acted upon, and give rise to electric currents, whilst others are, under the same circumstances, comparatively passive. This has led to the tabulation of the simple substances into a group, where the more readily acted upon, or electro-positive element, is placed at the one end of the series, and the less active, or electro-negative element, at the opposite end. The following table, mainly constructed by Berzelius, will shew the electric order of the majority of the elements.

*Electro-positive.*
Potassium.
Sodium.
Lithium.
Barium.
Strontium.
Calcium.
Magnesium.
Aluminium.
Uranium.
Manganese.
Nickel.
Cobalt.
Cadmium.
Lead.
Tin.
Bismuth.
Copper.
Silver.
Mercury.
Palladium.
Platinum.
Gold.
Hydrogen.
Silicon.
Titanium.
Tellurium.
Antimony.
Carbon.
Boron.
Tungsten.
Molybdenum.
Vanadium.
Chromium.
Arsenic.
Phosphorus.
Iodine.
Bromine.
Chlorine.
Fluorine.
Nitrogen.
Selenium.
Sulphur.
Oxygen.
*Electro-negative.*

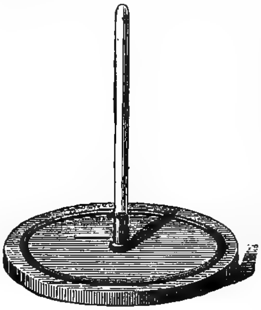
**ELECTROLY'SIS**, or **ELECTRO-CHE'MISTRY.** See Galvanism.

**ELECTRO-MA'GNETISM.** See Magnetism and Magneto-Electricity.

**ELECTRO-META'LLURGY.** See Galvanism.

**ELECTRO-MOTIVE MACHINES.** See Magneto-Electricity.

**ELECTRO'PHORUS.** This generally consists of a tin mould filled with shell-lac, and a movable metal cover, with a glass handle, as shewn in the figure. The shell-lac is poured in when melted, and it is mixed with some other substance, to make it less brittle. Five parts of shell-lac, one of wax, and one of Venice turpentine, is given as a good mixture. When used, the surface of the cake of shell-lac is smartly beaten with a cat's fur or foxtail. The cover is then put on, and touched with the finger, which receives a slight spark of – electricity, just before contact takes place; and after the finger is removed, the cover, when lifted by its insulating handle, gives a brisk spark of + electricity to anything presented to it. This can be repeated for several minutes without any apparent exhaustion of the source of electricity; and in dry weather, sparks can be got in this way hours, and frequently days, after the cake has been beaten.



Electrophorus.

The action of the electrophorus may be thus accounted for. When the surface of the cake of shell-lac is beaten, the friction excites – electricity on it. This acts inductively all round, but the tin mould being the nearest conductor, and shell-lac a good dielectric, the induction becomes concentrated on it, + electricity becoming fixed on the side next the shell-lac, and – electricity being sent to the ground. The – electricity of the upper surface of the shell-lac is thus fixed by the + electricity of the mould. When the cover is put on the cake, the contact between the two is not sufficient to allow the latter to communicate its charge to the former. The cover is thus acted on inductively, not conductively. The – electricity of the cake, then, has the choice of two channels for its induction, either through the cake to the mould, or through a very thin film of air to the cover. The latter, from its offering so short a passage through the dielectric, has the preference, and the inductive action of the charge is diverted from the mould to the cover, and the + electricity on the other side of the cake is thus liberated and lost in the ground. The cover being strongly polarised, + electricity is induced and fixed on its lower surface, and – electricity on its upper, this last being transmitted to the ground by the finger. When the finger is withdrawn, and then the cover, the + electricity of the latter is free to discharge itself by spark, and inductive action again takes the direction of the mould, once more attracting + electricity to it. The induced polarity of the cover is attended with no loss to the charge of the shell-lac, which can thus continue to act with the same efficiency. The loss of electricity that all charged bodies experience in air, and especially when moist, at length discharges the cake, but this takes place all the less readily, that when the electricity is not needed to act on the cover, it is kept bound by the + electricity induced by it in the mould. In order that the + electricity of the mould should have liberty, so to speak, to come and go, the electrophorus must not be insulated; and when it is so, the action on the cover is feeble, if at all perceptible.

**ELECTRO-PLATING, ELECTRO-TYPE.** See Galvanism.

**ELE'CTRUM** is a term used to designate native gold as it is associated with silver. It is also applied to amber.

**ELE'CTUARY** (Lat. *eligere*, *electum*, I make choice), a form of medicinal preparation in which the remedy is enveloped or suspended in honey or syrup, so as to make a mixture of thick semi-fluid consistence.

**ELE'GIT,** Estate by, the right in lands which is enjoyed by one who has acquired the land under writ of Elegit (q. v.).

**ELEGIT,** Writ of, a writ whereby a creditor in England can seise the lands of his debtor in satisfaction of his claim. Before the reign of Edward I., a creditor could not enforce a claim of debt against the lands. But by statute of Westminster the second, 13 Edw. I. c. 18, it was enacted that the goods and chattels of the debtor should first be appraised, and if these were not sufficient, that the half of the freehold lands of the debtor should be delivered to the creditor, to be held by him until the debt was paid out of the rents and profits thereof. By 1 and 2 Vict. c. 110, the whole of the lands, including copyhold and customary lands, are made subject to the debt. A creditor who has seised the lands, is not entitled to take the person of his debtor; so that the creditor must make his choice to take the goods and person, or the goods and land, but he cannot attach land and person.

**E'LEGY** (Gr. *elegeia*), according to its derivation, signifies, exclusively, a song of lamentation, but the term was employed at an early period by the Greeks to designate any poem written in distiches. The alternation, peculiar to this measure, of the hexameter, or strictly narrative verse, with the more fiery pentameter, gives to this whole species of poetry its individual character, which consists in the connection of subjective feelings and emotions with external incidents or objects. The elegy, therefore, can often be chiefly, but never altogether narrative. The effect of the measure is further shewn in the circumstance, that earnest, long-sustained feelings, rarely violent passions, are expressed in the elegy. Of the numerous elegies of the Greeks, few have come down to us. Those still extant consist partly of encouragements to patriotism, as in Callinus and Tyrtæus, and partly of lessons of practical wisdom, as in Solon and Theognis. Sometimes also it expressed yearning desire or mild sorrow, or amorous complaints. This was especially the case at Alexandria. Among the Romans, Catullus was the first good elegiac writer; after him came Propertius, Tibullus, and Ovid. Tibullus, in particular, brought the erotic elegy to its highest perfection. All are marked by the absence of political or moral feeling. They lived at a time when it was dangerous to express the one, and unfashionable to express the other—viz., the Augustan age. In modern times, the term elegy is applied in England to any serious piece where a tone of melancholy pervades the sentiments, whether grief is actually expressed or not; as, for example, Gray's '*Elegy*, written in a country churchyard.'

Elegy, in Music, is a composition depicting feelings of mourning, sadness, longing or ardent desire, and love.

**ELEME'NTAL SPI'RITS,** beings who, according to the popular belief of the middle ages, presided over the four 'elements,' living in and ruling them. The elemental spirits of fire were called Salamanders; those of water, Undines; those of the air, Sylphs; and those of the earth, Gnomes. These imaginary beings play a part in Pope's mock-heroic poem, *The Rape of the Lock*.

**E'LEMENTS**, in Astronomy, are those numerical quantities, and those principles deduced from astronomical observations and calculations, which are employed in the construction of tables exhibiting the planetary motions. They include the greatest, least, and mean distances of the planets from the sun, the eccentricities of their orbits, their mean motions, daily and annual, with the motions of their aphelia, and the inclinations of their orbits to the ecliptic; their masses and densities, &c. The elements of the different planets and of their satellites will be found under their names. The reader will find tables of the elements of all bodies in our system in most books on astronomy. See in particular Herschel's *Elements of Astronomy*.

**ELEMENTS**, Chemical. The word elements has a very different signification in modern science from what it once had. The earliest of the Greek philosophers assumed either a single element, or several, the modifications and combinations of which they held to give rise to all the things that we see. The most common assumption was that of four elements—fire, air, water, and earth. This corresponds to the four forms under which modern science considers matter as existing—viz., imponderable, gaseous, liquid, and solid; while by elements are understood the simple component ingredients of bodies under whatever form they exist. Neither air, water, nor earth are elements in this sense, for they can be decomposed into simpler ingredients, and fire is a combination of light and heat. It is not pretended that any of the substances called elements are absolutely simple, that is, contain only one kind of matter; but only that hitherto they have not been decomposed. The number of so-called simple bodies, or elements, recognised by chemists at the present time (1861) is 63, of which some have been known from ancient times, such as the metals gold, silver, lead, copper, tin, and mercury; others are of more recent date; whilst within the last year, two new metallic elements have been added to the list—viz., Coesium and Rubidium, both of which were discovered by Professor Bunsen of Heidelberg, by the aid of the new branch of practical chemistry named *Spectrum analysis*. The elements are divided into two great classes—the *non-metals* and *metals*. The latter are the more numerous class, there being altogether 50, whilst the non-metals number only 13. The following table gives the names of the elements at present known.

TABLE OF THE ELEMENTARY SUBSTANCES.

NON-METALLIC.

Oxygen.
Hydrogen.
Nitrogen.
Carbon.
Boron.

Silicon.
Sulphur.
*Selenium.*
Phosphorus.

Chlorine.
Bromine.
Iodine.
Fluorine.

METALLIC.

Potassium.
Sodium.
*Lithium.*
*Coesium.*
*Rubidium.*
Barium.
Strontium.
Calcium.
Magnesium.
Aluminium.
*Beryllium* (*Glucinum*).
*Zirconium.*
*Thorium.*
*Yttrium.*
*Erbium.*
*Terbium.*
*Cerium.*

*Lanthanum.*
*Didymium.*
Chromium.
Zinc.
Manganese.
Nickel.
Cobalt.
Iron.
Lead.
Silver.
Mercury.
Copper.
Bismuth.
*Cadmium.*
*Uranium.*
Gold.
Platinum.

*Palladium.*
*Rhodium.*
*Iridium.*
*Ruthenium.*
*Osmium.*
Antimony.
Tin.
*Tungsten.*
*Molybdenum.*
*Vanadium.*
*Tantalum* (*Columbium*).
*Ilmenium.*
*Niobium.*
*Titanium.*
*Tellurium,*
Arsenic.

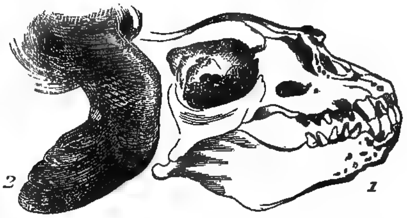
The more rare elements are printed in *italics*. Although the classification adopted above is a convenient one for the study of the elements, yet there is no decided line of demarcation between the metallic and non-metallic (otherwise called metalloid) series. The metals are generally recognised (1) by their power of reflecting light, as exhibited in the lustre of burnished gold, and even in ordinary mirrors, which owe their power of reflecting light to the amalgam of the metals mercury and tin, present on the glass; (2) by their power of conducting heat; and (3) by their ready transmission of electricity. The non-metals or metalloids are regarded as not possessing all these three attributes. The non-metals carbon and silicon, however, in certain forms conduct electricity, whilst the metals arsenic and tellurium very closely resemble the metalloids in many of their properties. In the combinations of the various elements with each other, the non-metals constitute the electro-negative ingredient, and, as a rule, are insulators in the galvanic current; whilst the metals form the electro-positive element of the combination, and are conductors of the electric fluid. Again, in their combination with oxygen, the non-metals form more or less powerful acids, whilst the metals produce more or less powerful bases. At ordinary temperatures, five of the elements are gaseous—viz., oxygen, hydrogen, nitrogen, chlorine, and fluorine; two are liquid—viz., bromine and mercury; whilst the remaining fifty-six are solid.

**E'LEMI**, a fragrant resinous substance, obtained from different species of the natural order *Amyridaceæ*. It was formerly brought chiefly from Egypt or Ethiopia, and was referred to a tree called *Amyris elemifera*. Part of the E. of commerce is now brought from America, and is obtained from trees of other genera, but of the same natural order, particularly *Icica Icicariba*, which grows in Brazil and other warm parts of America. In dry weather, incisions are made in the bark, from which the resinous juice flows abundantly, and hardens in the sun. It is collected once a day, and put into casks. It is at first soft and unctuous, but becomes hard and brittle by age. *Elaphrium elemiferum* is believed to yield the greater part of the E. of Mexico. E. is usually in large, pale-yellow, semi-transparent masses, fragile, softening by the heat of the hand, with a smell somewhat resembling that of fennel. It is soluble in alcohol, except a white crystallisable residue, which is very light, inodorous, and tasteless, and which is called *Elemine*. The properties of E., however, chiefly depend on a volatile oil, which may be obtained from it by distillation. E. is used in the preparation of stimulant plasters and ointments.

**E'LEPHANT**, a geographical term of obvious origin, indicates various localities in Asia and Africa.—1. Elephant Point, a promontory of Pegu, in Further India, marks the west extremity of the mouth of the Rangoon, the most easterly arm of the Irrawaddy. It is in lat. 16° 28′ N., and long. 96° 25′ E.—2. Elephant Bay, an inlet of the Atlantic, on the coast of Benguela, South-west Africa, in lat. 13° 14′ S., and long. 12° 33′ E., has excellent anchorage, but no fresh water.—3. Elephant Island, in Senegambia, is about 100 miles up the Gambia.—4. Elephant River, in the Cape Colony of South Africa, enters the Atlantic after a course of 140 miles, about lat. 31½° S., and long. 18° E.

**ELEPHANT**, Sea (*Macrorhinus proboscideus*), also known as the Elephant Seal, the Proboscis Seal, &c., is the largest of the Seal family (*Phocidæ*), an inhabitant of the seas of the southern hemisphere. It is more than twice as large as an elephant, being sometimes thirty feet in length, with a circumference of about eighteen feet at the thickest part, which is at the chest, immediately behind the fore-flippers or swimming-paws; the body tapering towards the tail. The colour is grayish, bluish gray, or more rarely blackish brown. The whole body is covered with very short hair, distributed in patches, giving it a spotted appearance somewhat like watered silk. The swimming-paws are large and powerful; the fore-paws have five nails, the thumb-nail easily distinguishable from the others; the hind-paws have not even the rudiments of nails, but are beautifully constructed like the webbed foot of a bird, so as to expand, and increase the power of swimming. The true tail is very short, not more than six inches long. The head is larger in proportion than in many seals; the eyes are very large and prominent, with eyebrows of coarse hair; the whiskers are composed of very long and coarse spirally twisted hairs: there are no external ears; the canine teeth are remarkably large and massive, somewhat assuming the character of tusks. The nose of the males is very remarkable, being prolonged into a kind of proboscis of about a foot long, which, however, is not at all an organ of prehension, and, indeed, seems to serve no purpose whatever analogous to those which are served by the proboscis of the elephant, but in its ordinary state hangs flaccid on the face, becoming distended like the wattle of a turkey when the animal is roused to passion of any kind, and in particular presenting this distended appearance during the rutting season. At that season, also, the males have furious combats, the victor winning for himself a whole herd of females. When the proboscis is dilated, the voice of the sea-elephant, which usually is like the lowing of an ox, is completely changed, and becomes a loud and extraordinary gurgling.

Sea-Elephant (*Macrorhinus proboscidcus*).



1, Skull and Teeth of Sea-Elephant; 2, Swimming-paw, or Flipper.

Sea-elephants are found on Kerguelen's Land, Juan Fernandez, South Georgia, the States Islands, South Shetland, the Falkland Islands, &c. They migrate southwards at the beginning of summer, and northwards at the approach of winter, thus avoiding the extremes of heat and cold. A single individual sometimes yields 1400 or 1500 pounds or 70 gallons of excellent oil, on account of which these animals are pursued to an extent that seems to have already much reduced the numbers of the species. They are either shot or killed by means of long lances. Cuttle-fish and other cephalopods seem to be their principal food; but remains of marine plants have also been found in the stomach.

The skin of the sea-elephant is not at all valued on account of its fur, but its thickness and strength make it very useful for harness-making and similar purposes. The flesh is black, oily, and indigestible; the tongue (salted) alone being esteemed a delicacy. The principal product, however, is the oil, which burns slowly, with a clear flame, and without smoke or disagreeable odour.

END OF VOL. III.

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